THE MARINE REVIEW

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MILLION MORE FOR NAVY.

On February 10, Senator Hale, chairman of the committee on naval affairs, reported to the senate the bill making appropriations for the support of the navy. The bill carries $136,825,199, an increase of $1,058,428 over the amount carried by the bill as it was passed by the house.

No change was made in the item providing for the construction of two 26,000-ton battleships. The senate committee provided that no part of the appropriation for the marine corps may be expended unless the corps is continued in service as heretofore on battleships, cruisers, and other naval vessels.

The recommendation of Secretary of the Navy Newberry, for the appointment of a commission to consider the reorganization of the navy department in order to provide for preparedness in case of war, and for the most economical methods of administration, was adopted by the committee. The commission is to consists of three senators, three representatives, three rear-admirals, with at least one in the active list; and three eminent civilians, to be appointed by the president. It is required that the commission shall report to the next session of congress.

AMENDMENTS TO BILL.

Some of the important amendments made by the senate committee are as follows:

The office of vice-admiral on the retired list is created. This, it is understood, is in the interest of Rear-Admiral Robley D. Evans.

(This item was eliminated when the bill was discussed in the senate.)

Provision is made for the appointment of a commission by the secretary of the navy to investigate and report to congress the advisability and necessity of establishing a naval base, including a navy yard and repair station on the California coast. The commission is to prepare an estimate of the cost.

There is also an amendment requiring that prisoners discharged from naval prisons shall be furnished with civilian clothing, and others authorizing the employment of fifteen contract dental surgeons; providing for the use of the crypt and window spaces of the Naval Academy chapel for memorials for naval officials, and striking out the provision which requires the secretary of the navy to submit to congress statements of amounts expended for repairs which have been made to ships.

INCREASES OF APPROPRIATIONS.

Some of the more important increases in appropriations are as follows: For the Mare Island navy yard, $224,000, of which $100,000 is for the improvement in the channel and $100,000 for ordnance stores. For Puget Sound, $237,000, to be used largely for the extension of the rapair shops at Bremerton navy yard; and to carry out the orders for placing marines back on ships $308,761.

A provision was inserted in the bill authorizing the secretary of the navy to investigate the subject of acquiring all or part of the Jamestown Exposition grounds at Norfolk, Va., to be used as a site for a naval training station.

The committee restored to the bill the provision adopted by the house committee on naval affairs, which was stricken out on the floor of the house, for the construction of three sub-surface boats. The provision limiting the price to be paid for any collier to $900,000 was stricken out of the bill.

An appropriation was recommended for the purchase of land at Charleston, S. C., for the marine corps.

WIRELESS ACTIVITY.

General Manager Bottomley, of the Marconi Wireless Telegraph Co. stated recently that the Republic disaster and the projected wireless legislation are resulting in a marked extension of wireless installations. The North German Lloyd Steamship Co. has ordered the apparatus put aboard the steamships Koenig Albert, Frederich der Grosse, Prinzess Alice, Neckar, Koenigin Louise, Prinzess Irene, Rhein, Main and Barbarossa. The two new steamships of this company, the Berlin and George Washington, are also to be fitted with this system, while the Hamburg-American Line will equip its new steamships Cleveland and Cincinnati.

In addition to these many steamship companies trading at South American ports have given orders for the equipment of their ships. Within the past few days the owners of fifteen ships have ordered the latest form of installation for their vessels.

Since the Republic disaster the American of the American-Hawaiian Line, which just cleared from Mexico, the Hawaiian of the same line, and the United States cable steamer Joseph Henry have been equipped.

In addition to these George Gould has just equipped his yacht Tonawanda and Leonard Richards has installed the system on the Columbine.

J. Pierpont Morgan was the first of the yachtsmen to adopt this system, as the Corsair has carried it for several months.

Senator Kittredge, chairman of the committee on inter-oceanic canals, declared in the senate Feb. 9 that it will be necessary to abandon the plan for a lock canal through the Isthmus in favor of a sea-level ditch. His declaration was indorsed by Senators Foraker and Teller.

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Shipbuilding During 1908.

The usual annual statistics issued by Lloyds Register show that during 1908, exclusive of warships, 523 vessels of 929,669 tons gross (viz., 454 steamers of 914,570 tons and 69 sailing vessels of 15,099 tons) have been launched in the United Kingdom. The warships launched at both government and private yards amount to 36 of 74,186 tons displacement. The total output of the United Kingdom for the year has, therefore, been 559 vessels of 1,003,855 tons. These totals are analyzed in the accompanying tables, but the following notes will also be of interest. In these notes, warships are excluded from consideration except where they are specially mentioned.

The output of mercantile tonnage in the United Kingdom during 1908 shows a decrease of 678,221 tons on that of last year, and is the lowest total recorded by the society for 15 years. As regards war vessels the total for 1908 is 60,289 tons less than in 1907.

Practically the whole of the tonnage launched has been built of steel, and over 98 1/3 per cent is composed of steam tonnage.

COMPARISON OF TONNAGE AFLOAT, 1907-8.

Of the total output, 60 per cent, or 554,995 tons (547,080 steam tons and 7,915 sailing tons), has been built for registration in the United Kingdom. In this connection, it should be noted that the tonnage of the United Kingdom vessels lost, broken up, etc., during the last 12 months appears, from the information at present in the possession of Lloyd's Register, to have been 176,690 tons (142,000 steam, 34,575 sail). Sales to foreign and colonial owners for the 12 months ended November, 1908, according to the registrar-general's returns, reached a total of 262,866 tons (209,757 steam, 53,291 sail). On the other hand 2,050 (all steam) were built abroad for United Kingdom owners, and purchases from foreign and colonial owners during the same period amounted to 51,551 tons (46,997 steam, 4,554 sail). The sailing tonnage of the United Kingdom would thus appear to have decreased by about 75,400 tons, and the steamer tonnage to have increased by 245,000 tons. The net increase of the United Kingdom tonnage at the end of 1908 is therefore about 169,600 tons. For the previous five years the estimated net increases were as follows: 1903, 405,000 tons; 1904, 429,000 tons; 1905, 469,000 tons; 1906, 764,000 tons (the highest figures on record); 1907, 426,800 tons.

VESSELS LAUNCHED FOR ABROAD.

The amount of tonnage launched for abroad during 1908 was 374,674 tons, forming 40 per cent of the total output, as compared with 34 per cent in 1907, 20 1/3 per cent in 1906, 21½ per cent in 1905, 18 2/3 per cent in 1904, 18 per cent in 1903 and 1902, 23 per cent in 1901 and 1900, and 19 per cent in 1899. The British colonies have provided the greatest amount of work for the ship builders of the United Kingdom, viz.:—74 vessels of 67,518 tons (7¼ per cent of the total output). Belgium occupies the second position with 40,039 tons, Holland and Norway come third and fourth with 33,274 tons and 32,273 tons, respectively, being followed by Greece (23,168 tons), Austria-Hungary (22,698 tons), and Sweden (20,979 tons).

SIZE OF VESSELS.

The increasing tendency to build steamers of large size has been again apparent in the output of the United Kingdom for 1908. During the four years, 1892-5, on an average, eight vessels of 6,000 tons and upwards were launched per annum in the United Kingdom; in the following four years, 1896-9, the average rose to 25, and to 39 for the four years 1900-3, and dropped to 27 for the four years 1904-7. During 1908, 28 such vessels were launched. Of vessels of 10,000 tons and upwards, only three were launched in the four years 1892-5; 17 were launched during the four years 1896-9; while 32 were launched during the four years 1900-3, and 20 during the four years 1904-7.

During 1908, ten vessels of 10,000 tons and above were launched, the names of which are as follows:—Rotterdam, 24,149 tons gross; Lapland, 17,540; Laurentic, 14,500; Megantic, 14,500; Minnewaska, 14,220; Orsova, 13,000; Otway, 13,000; Orcoma, 11,533; Morea, 10,890; Malwa, 10,700.

At the present time there are under construction 20 vessels of 6,000 tons and upwards, of which 12 are over 10,000 tons each.

The average tonnage of steamers launched in the United Kingdom during 1908 is 2,014 tons; but if steamers of less than 500 tons be excluded the average of the remaining steamers reaches 3,281 tons gross.

OUTPUT OF LEADING PORTS.

The Glasgow district occupies the first place among the principal shipbuilding centers of the country, showing an output of 233,830 tons. Then follow in order Newcastle (174,259 tons), Belfast (153,517 tons), Greenock (103,470 tons), Sunderland (86,547 tons), Middlesbro' (57,210 tons), and Hartlepool (37,843 tons). In warship tonnage Newcastle leads with 21,830 tons, followed by Devonport and Portsmouth with 19,250 tons each.

TURBINE VESSELS.

Three vessels in which the turbine method of propulsion has been adopted were launched in the United Kingdom during 1908. Their names are as follows: Ben-my-Chree, 2,651 tons gross; Munich, 2,410; Vanadis (yacht) 1,092.

Two other vessels were also launched in which turbines are used in conjunction with reciprocating engines. The Laurentic, of 14,500 tons, and the Otaki, of 7,420 tons.

At the end of 1903 there were under construction in the United Kingdom four merchant vessels of about 11,400 tons which are to be fitted with steam turbines, and two others of about 49,700 tons, which will have turbines as well as reciprocating engines.

OTHER SPECIAL TYPES.

A feature of the year's work is the number of vessels built to carry oil in bulk, 19 such vessels, of a total tonnage of 90,785 tons, having been launched. One of these, it may be noted, has been constructed on the longitudinal framing system. The returns also include a second vessel on this system; nine vessels of the turret deck, trunk deck, and wing tank types; 88 steam trawlers and other fishing vessels; 45 dredgers, barges, etc., 20 tugs; seven yachts; and other vessels designed for special service. Besides these, 64 vessels, principally intended for river and harbor purpoes, have been built in the United Kingdom and taken to pieces for shipment abroad.

PROGRESS OF WORK IN HAND DURING THE YEAR.

As regards the movement of the shipbuilding industry during the course of 1908, Lloyd's Register returns show that, at the opening of the year, irrespective of warships, 948,830 tons (936,378 steam, 12,452 sail) were being built in the United

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Kingdom. The returns for the March quarter indicated a decrease of over 100,000 tons in the work in hand, and those for September a further decrease of 114,000 tons. A slight increase has since taken place, and at the present time the tonnage under construction amounts to 764,520 tons, which, however, is only 54¼ per cent of the total for June, 1906. The total warship tonnage under construction in the country is now 219,271 tons displacement, as compared with 268,717 at the end of 1907.

COLONIES AND FOREIGN COUNTRIES.

It appears that there have been built abroad during the year 882 vessels of 903,617 tons (550 steamers of 791,609 tons and 332 sailing vessels of 112,008 tons). These figures show a decrease of over 265,000 tons as compared with those for 1907. Among foreign countries the leading places are held by the United States of America (304,500 tons), Germany (207,800 tons), France (83,400 tons), Japan (59,700 tons), Holland (58,600 tons), and Norway (52,800 tons).

The total output of war vessels (91 of 235,503 tons displacement) shows an increase of about 49,000 tons displacement on the figures for the preceding year.

UNITED STATES.

The total mercantile tonnage reported from the United States (304,543 tons) is 170,000 tons smaller than that of the previous year; the decrease in the tonnage built for service on the great lakes being no less than 111,000 tons. The figures for this district include 17 steamers of over 5,000 tons, the largest of which were the James Corrigan and the Daniel B. Meacham, of 6,971 tons each, both launched by the Great Lakes Engineering Works of Detroit, Mich.

The largest sea-going merchant steamer launched was the Oklahoma, of 5,853 tons, built at Camden, N. J., the only one of over 5,000 tons launched on the coast during the year. There were also launched, at Bath, Me., three wood sailing schooners of over 3,000 tons each.

Mention may also be made of two large fleet colliers, the Vestal and the Prometheus, of about 12,500 tons displacement each, launched at the navy yards at New York and Mare Island, Cal., respectively.

GERMANY.

The returns show a decrease of over 67,000 tons in the shipbuilding output as compared with last year. During the years 1900-1904 the average yearly output was about 204,000 tons. In 1905, 255,000 tons were launched, and in 1905, 318,000 tons. Since then there has been a considerable decrease, the present figures (207,800) being 110,000 tons less than two years ago. It should be stated, however, that these figures do not include vessels launched on the upper rivers, the total of which amounts to over 18,000 tons.

The largest steamers launched in the country during 1908 were the George Washington, of about 25,000 tons (this being also the largest steamer launched in the world during the year), and the Cincinnati, of about 20,000 tons. Five other steamers of between 6,000 and 10,000 tons were also launched, and two of between 15,000 and 20,000 tons.

A Belgian training ship, the steel four-masted barque L'Avenir, of 2,738 tons, was also launched in Germany during 1908.

FRANCE.

The tonnage launched in France, which had shown the striking decrease of 157,000 tons from 1902 to 1906, has since steadily increased. The figures for 1907 were 25,000 tons better than those for 1906, and the present total (83,400 tons) is 22,000 tons larger than that of 1907.

This increase does not apply only to the amount of tonnage produced, but is also apparent in the size of the vessels launched. The figures include six steamers of 6,000 tons and upwards, the largest being the Ouessant and the Corse, of about 8,500 tons each, both launched at St. Nazaire.

JAPAN.

The figures for Japan (59,725 tons) show a slight decrease as compared with those of 1907. They include four steamers of about 8,600 tons each. At the present time there are under construction nine steel steamers of over 72,000 tons, the largest being one of 13,500 tons, to be fitted with turbines.

HOLLAND.

The total tonnage (58,604 tons) launched in Holland during the past year does not include vessels known to be exclusively intended for river navigation. The figures show a slight decrease on those for 1907. From returns received from that country it appears that the tonnage of barges, lighters, and other river vessels launched during 1908 amounts to over 28,000 tons.

NORWAY.

The total output of Norway (52,839 tons), is slightly below that recorded for 1907, and, as in that year, a large proportion of the steamers are between 1,000 and 1,500 tons. The present figures, however, include two steamers over 3,000 tons each:—The Texas, of 3,632 tons, and the Noruega, of 3,546 tons.

The returns under review show that the general increase which had taken place during 1907 in the output of most of the other countries has not been maintained in 1908. With the exception of Austria-Hungary, where an increase of about 15,000 tons has taken place, there has been a considerable reduction in the total tonnage launched.

SUMMARY OF WORLD'S OUTPUT.

The total output of the world during 1908 (exclusive of warships) appears to have been 1,833,286 tons (1,705,179 steam, 127,107 sail). According to the latest returns received by Lloyd's Register, the tonnage of all nationalities totally lost, broken up, etc., during the 12 months amounts to about 794,000 tons (557,000 steam, 237,000 sail). The net increase of the world's mercantile tonnage at the end of 1908 is thus about 1,039,000 tons. Sailing tonnage has been reduced by 110,000 tons, while steam tonnage has increased by 1,149,000 tons.

Of the tonnage launched during 1908, the United Kingdom has acquired over 30¼ per cent. Of the total merchant tonnage output of the world during 1908, 50¾ per cent was launched in the United Kingdom; but, if only sea-going steel steamers of 3,000 tons gross and upwards be taken into account (thus excluding vessels trading on the North American lakes), out of the total of 179 such steamers, of 1,050,741 tons launched in the world, over 63½ per cent of the tonnage has been launched in the United Kingdom.

VESSELS CLASSED BY LLOYDS REGISTER.

Of the vessels launched during 1908, 406 of 764,146 tons (including 70 vessels of 153,558 tons launched abroad), have been built under the society's inspection with a view to classification in Lloyd's Register book. In addition, nearly 100 vessels of less than 100 tons each, to be classed with Lloyd's Register, were launched.

The citizens of Birmingham, Ala., presented a silver service and a loving cup to the scout cruiser Birmingham as she lay at Mobile Feb. 1. The presentation was made by Gen. R. L. Rhodes, editor of the *Birmingham News*, who made a plea for the American merchant marine. His remarks were frequently applauded.

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ST. LAWRENCE & CHICAGO STEAM NAVIGATION CO., LTD.

The annual meeting of the St. Lawrence & Chicago Steam Navigation Co., Ltd., was held at Toronto, Ont., Jan. 16, and the following report was presented:

The season of 1908 on the lakes was a very unsatisfactory one, rates of freight ruling very low throughout the entire season. The new steamer E. B. Osler was completed and delivered to the company on May 16, 1908, and went into commission at once. The company's steamships met with more than their share of accidents during the season. The E. B. Osler and G. R. Crowe each had two serious strandings, which materially reduced the profits of the year, although being fully covered by insurance, no direct loss was sustained. The directors from the earnings of the season have paid a dividend of 7 per cent on the capital stock, and have carried forward $415.32 to the credit of profit and loss, leaving a balance at the credit of that amount of $102,383.55.

ASSETS.

Five steamships, Algonquin, Iroquois, W. D. Matthews, G. R. Crowe, E. B. Osler		$950,000.00
Insurance unexpired		11,000.00
Accounts receivable		5,050.12
		$966,050.12

LIABILITIES.

Capital		$855,700.00
Dominion Bank		7,966.57
Balance of profit carried forward		102,383.55
		$966,050.12

PROFIT AND LOSS.

Balance forward, Jan. 2, 1908		$101,968.23
Steamships' earnings	$114,299.85	
Interest	2,249.30	
		116,549.15
		$218,517.38
Insurance		$ 43,494.97
Cost of management, salaries, taxes, office rent, directors' and auditors' fees, etc.		12,759.86
Dividend, 7 per cent payable Jan. 2, 1909		59,899.00
Balance carried forward		102,383.55
		$218,517.38

The officers and directors were re-elected for the current year as follows: President, W. D. Matthews; other directors, E. B. Osler, J. H. G. Hagarty, S. Crangle, C. S. Gzowski, G. F. Hagarty, G. R. Crowe, Jas. Carruthers.

NIAGARA NAVIGATION COMPANY, LTD.

The following report for the year ended Nov. 30, 1908, was presented at the annual meeting in Toronto, Jan. 12. "The net earnings are slightly in excess of those for 1907. No expense has been spared to maintain the steamers at the highest degree of efficiency. Following the policy of past years the directors have written off a further sum of $25,000 from the valuation of steamers, and have placed $10,000 to a renewal and betterment fund. An opportunity having recently arisen to purchase the Lewiston wharf and land adjoining at a cost of $25,000, the directors have considered it wise to secure the property, subject to title being found satisfactory. Payment will be made out of cash on hand. After providing for the dividend, interest on debentures, writing off steamer values, and placing $10,000 to a renewal and betterment fund, the balance to credit of profit and loss account stands at $133,394.48."

ASSETS.

Steamers	$884,725.33	
Less written off	25,000.00	
		$ 859,725.33
Real estate, wharves, etc.		50,000.00
Accounts receivable		1,829.31
Cash in Dominion Bank		91,820.34
		$1,003,374.98

LIABILITIES.

Capital stock authorized	$1,000,000.00	
Subscribed and paid		$ 701,700.00
Debentures outstanding, 4½ per cent.	125,000.00	
Accrued interest on same	2,343.75	
		127,343.75
Reserve for renewals and betterments		10,000.00
Accounts payable		2,868.75
Dividend 4 per cent, payable Jan. 2, 1909		28,068.00
Balance at credit of profit and loss		133,394.48
		$1,003,374.98

PROFIT AND LOSS ACCOUNT.

Balance Dec. 1, 1907		$129,692.16
Net earnings for year		102,510.28
		$232,202.44
Interest on debentures		$ 5,625.00
Written off steamers		25,000.00
Reserve for renewals and betterments		10,000.00
Stores written off		2,046.96
Dividend 4 per cent paid July 2, 1908	$28,068.00	
Dividend 4 per cent payable Jan. 2, 1909	28,068.00	
		56,136.00
Balance carried forward		133,394.48
		$232,202.44

The president, E. B. Osler, in moving the adoption of the report, expressed the hope that a continuance of good business would, in a short time, enable the company to redeem its outstanding debentures. He and the vice president, Barlow Cumberland, expressed warm approval of the work done by B. W. Folger, general manager.

The directors were all re-elected. The officers and directors for the current year are: President, E. B. Osler; vice president, Barlow Cumberland; other directors, Hon. J. J. Foy, C. Cockshutt, J. Bruce Macdonald, W. D. Matthews, Hon. J. S. Hendrie; general manager, B. W. Folger; treasurer, R. H. McBride; secretary, J. M. Sullivan.

The Ollinger & Bruce Dry Dock Co., Mobile, Ala., has been awarded a contract for repairing the lighthouse tender Mangrove on its bid of $628.

JANUARY LAKE LEVELS.

The United States lake survey reports the stages of the great lakes for the month of January, as follows:

Lakes.	Feet above tide water New York.
Superior	601.71
Michigan-Huron	579.86
Erie	571.47
Ontario	245.17

Since last month, Lake Superior has fallen 3½ in., Lakes Michigan and Huron have fallen 3½ in., Lake Erie has risen 1 in., and Lake Ontario has fallen 3¾ in.

During February, Lake Superior is likely to fall 2¾ in. and Lakes Michigan and Huron are likely to rise ¼ in.; Lake Erie should fall 2 in. and Lake Ontario should rise ¾ in. Winter predictions are subject to the uncertainties growing out of the effects of ice retarding the outflow in the rivers.

Lake Superior is 8¼ in. lower than the average January stage of the past ten years and about 4¾ in. lower than last year. It is 7¼ in. higher than in January, 1893, but 12 in. lower than in 1906 and 12¾ in. lower than in 1901.

Lakes Michigan and Huron show a stage 2¾ in. lower than the average January stage of the past ten years and 7¾ in. lower than last year, but 9¼ in. higher than in 1896. In January, 1886, the water was 33¾ in. higher.

Lake Erie is 13¼ in. lower than in January last year. It is 3 in. below the mean January stage of the past ten years, but 6 in. higher than in 1896. It is 16¼ in. lower than in January, 1878, and 25 in. lower than in 1886.

Lake Ontario is 18¾ in. lower than in January last year and 2 in. lower than the average January stage of the past ten years. In 1852 it was 23¼ in. higher, and in 1886 29¼ in. higher than in 1909. In January, 1896, it was 16½ in. lower.

The British cruiser Superb, which was built at the Elswick yards of Armstrong, Whitworth & Co., is to be finished at the works of the Palmer Ship Building & Iron Co., Ltd., Jarrow-on-Tyne, and she has been taken there in accordance with an arrangement with the builders. Considerable work remains to be done on her.

Capt. P. F. Thrall, of Green Bay, Wis., reports that he is building an 80-ft. harbor tug for the market.

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SHIP YARD NOTES.

The New York Ship Building Co., Camden, N. J., has a contract for the construction of two steel car floats for the Lackawanna railroad.

The Bath Iron Works, Bath, Me., has at the present time 1,161 names on its payroll, this being the largest number of employes in the history of this plant.

Britt Bros., West Lynn, Mass., are building a 55-ft. single-screw power yacht for George B. Spearin, of New York. The yacht is from designs by H. J. Gielow and is to be completed by Decoration Day.

J. H. Price, the Bandon, Ore., ship builder, has been at San Francisco recently for the purpose of conducting negotiations for the lease of the Bendixsen ship yard, located at Eureka, Cal.

Bids received by the lighthouse inspector at Key West, Fla., for repairs to the tender Hibiscus, opened Jan. 26, were as follows: Ollinger & Bruce Dry Dock Co., Mobile, Ala., $752.89; George Bruce, Bagdad, Fla., $867.

Bids for repairs to the lighthouse tender Manzanita, received by the lighthouse inspector at San Francisco, Cal., Jan. 30, were as follows: W. A. Boole & Son, San Francisco, $694, accepted; Union Iron Works, San Francisco, $741.50.

The New Orleans Dry Dock & Shipbuilding Co., New Orleans, La., is to build a new steel hull for the lighthouse tender Golden Rod, which is stationed in the Ohio river. The contract requires the completion of the work in 50 days.

The United Engineering Works, San Francisco, Cal., has been awarded the contract for repairing lighthouse tender Sequoia, on its bid of $843. Other bids were: Union Iron Works Co., $863; W. A. Boole & Son Co., $850.

The 170-ft. steam yacht which is being constructed by Pusey & Jones, Wilmington, Del., for the great lakes, is for William Lydon, of Chicago. She will be the largest of her type owned in Chicago and is to cost about $85,000.

Alex Miller & Bro., foot of Morris Street, Jersey City, N. J., are building an ocean-going cable steamer for the Western Union Telegraph Co. The hull, which is of wood construction, is 150 ft. in length. The machinery will also be built at the Miller yard.

The Kelley-Spear Co., Bath, Me., has a contract for building a steamboat for the Popham Steamboat Co., to replace the steamer Eldorado, destroyed by fire. The new steamer is to be 74 ft. long, 20 ft. beam and 17 ft. deep and was designed by E. F. Kelley.

The Italian liner Florida, which sunk the White Star line steamship Republic, is to be docked and repaired by the J. N. Robins Co., at its Erie Basin dry dock in Brooklyn, N. Y. Her bow was badly damaged in the accident.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is repairing the Norwegian steamship Texas, which was badly damaged by fire while on her maiden voyage from Christiana to Havana. The work will occupy about three months and will cost about $20,000.

The Bath Marine Construction Co., Bath, Me., has a contract for building an 80-ft. gasoline motor boat for Hartley C. Baxter, of Brunswick, Me. The boat is to have a beam of 14 ft., will be propelled by two gasoline engines with a combined horsepower of 100. She is large enough to accommodate twelve people and is expected to attain a speed of 15 miles an hour.

The schooner which the Gilbert Transportation Co., of Mystic, Conn., is to build, will be constructed at the yard of M. B. McDonald & Sons, at New London, which the Gilbert company has leased for the purpose. M. B. McDonald has been engaged to superintend the construction of the new craft.

Bids received by the lighthouse inspector at Boston, Mass., for making repairs to the tender Myrtle, opened Jan. 27, were as follows: Portland Ship Building Co., Portland, Me., $1,108.63; R. T. Green Co., Chelsea, Mass., $1,130.13; D. D. Keley & Son, East Boston, Mass., $1,375; Joseph D. McPhee & Co., East Boston, Mass., $1,399.86; Bertelsen & Peterson Engineering Co., East Boston, Mass., $1,486.43; Fore River Ship Building Co., Quincy, Mass., $1,410.85. The bid of R. T. Green Co., Chelsea, Mass., was accepted.

The Tampa Foundry Machine Co., Tampa, Fla., is building the big dredge Caloosahatchee for use on the Caloosahatchee river and has a sister dredge, the Miami, almost ready for delivery. The Miami is for use at Miami, Fla.

The Moran Co., Seattle, Wash., has been awarded a contract by the Katalla Co. for the construction of three stern-wheel river boats for use in Alaskan waters. The Katalla Co. is one of the Guggenheim corporations The boats will be of the light draugh: type and are to be 120 ft. long. They are to be completed April 1.

The Union Iron Works Dry Dock Co., of San Francisco, has recently been incorporated with a capital stock of $200,000, the incorporators and officials being the same as those of the Union Iron Works. The new company will operate the Hunter's Point dry dock, which was recently purchased by Mr. Charles M. Schwab, who controls the Union Iron Works. Work will also be pushed on the new $1,000,000 dock planned by Mr. Schwab, which is to be built with a view to obtaining a large amount of work from the navy department and other branches of the government which employ vessels.

The Ker Lloyd Iron Works, San Francisco, Cal., has the contract for repairing light vessel No. 93, having bid $500 for the work. Other bids were: United Engineering Works, $515; Union Iron Works Co., $550.

The Ker Lloyd Iron Works, San Francisco, Cal., has obtained the contract for repairing light vessel No. 88, its bid having been $525. Other bids were: Union Iron Works Co., $570; United Engineering Works, $605.

The Hall Bros. Shipbuilding & Marine Railway Co., Winslow, Wash., has been awarded the contract for building two car ferries for the Chicago, Milwaukee & Puget Sound Railway for use at its ocean terminals in Tacoma and Seattle. Work on the construction of the ferries is to begin at once and delivery is to be made June 15. The craft are to be alike, each being designed for a length of 190 ft. and a beam of 42 ft. They will have a capacity for ten cars each.

The New England Co., Bath, Me., has resumed work on the four-masted schooner building to the order of Capt. James W. Hawley on which construction had been suspended since spring. Capt. Hawley has sold the vessel to the Gilbert Transportation Co., of Mystic, Conn., and she is to be made ready for launching by the middle of February. The schooner will be rigged by Frank A. Palmer, of Portland.

William Cryer, Oakland, Cal., is constructing a twin-screw towboat 45 ft. in length for Peter Nelson & Co., of San Francisco for use as a tender in the Alaskan cannery trade. She is to go north early in the spring.

W. J. Gokey & Co., Brooklyn, N. Y., dry docked the schooner J. S. Lamprey, which had been towed to port in a water logged condition. The Lamprey is owned by Washburn Bros., Thomaston, Me. The dredge Champion is also dry docked at Gokey's where she will be rebuilt and given a new boiler.

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CRITICIZING THE NAVY.

Under the caption, "Our Navy on the Land," George Kibbe Turner, in the February *McClure's,* points out the defects in our navy yard system, its dependence on the fortunes of politics and the remedies he would apply. Millions upon millions, he contends, are "wasted" annually upon our yards, which even then are not in fit condition. Of the politics of the thing, Mr. Turner says:

"In 1899 the navy department was well on the way towards concentrating its Atlantic coast navy yards, and forming two strong naval bases at New York and Norfolk, Va. When the flood of money for the new navy was first loosed in that year, this development of a naval shore establishment immediately stopped; and congress started reopening old yards, and building that extraordinary existing structure—our navy on the land.

"One of the first of the abandoned yards to be reopened was Senator Hale's home navy yard at Kittery, Me., which was closed by W. E. Chandler, of New Hampshire, when he was secretary of the navy. As a location for a navy yard this is something like Hell Gate, from a navigator's standpoint. Among the first things done by congress for the new navy yard after the Spanish war was the authorization of a half-dozen million-and-a-quarter-dollar dry docks. One of these was placed at Portsmouth—in a position that was practically inland, because no battleship captain dared to go up to it. Soon after, however, nearly a million dollars more was secured to connect this dock with the sea by blowing out a rock known locally as "Pull-and-be-damned Point." The first battleship reached the Portsmouth dock last fall. This plant, aside from the money spent in work there, has cost the United States in the past ten years $10,000,000 for maintenance and development.

"Mr. Perkins, of California, has secured $13,000,000 for the maintenance and improvement of the Mare island yard in the past ten years, including the cost of an excellent dry dock, capable of holding the largest battleship in the world. Unfortunately, it is impossible to bring a battleship to this yard—some 6 ft. of water being lacking.

"Senator Penrose of the committee has also received about $13,000,000 for the improvement and maintenance of the League island yard at Philadelphia during these last ten years—this money also including an excellent dry dock, with 30 ft. of water over its sill. Battleships—at ordinary draught—can reach this yard at high water. In case they were heavy with water after a naval battle, they would have to remain permanently outside, since 29 ft. of water is the most given at any tide in the channels to League island.

"Senator Tillman, of South Carolina, went on the senate committee of naval affairs in 1895. On March 1, 1899, he arose and said very candidly concerning the naval appropriation bill:

"'This bill is loaded down with expansion in every navy yard. I am trying to get a little for Port Royal; because, if you are going to steal I want my share.'

"A few minutes later he went on as follows: 'I will say to the senator right here, that we have a little orphan of a naval station down in South Carolina for which I am trying to get a few crumbs of this money which is being wasted.'

"This was spoken concerning the old naval station at Port Royal, S. C. About $2,000,000 were spent in building and maintaining this yard in the nineties. In 1901 it was ostensibly given up in favor of a yard at Charleston.

"We have 12 navy yards. Five of them—including the best and biggest plant of all—haven't the principal thing a navy yard is built for—that is, a dry dock big enough to hold the battleships we are now completing. Two of them have one fine dock apiece, which no battleship can reach at any tide; and three of them one costly dock apiece, cut off from the sea by shoal water which battleships can only cross at certain times in the tide; and which, if they were waterlogged in time of war, they could not cross at all.

"If the navy department had been allowed to develop, as it wished, along military lines, there would be now three great naval bases on the Atlantic—one at New York to take care of the upper coast; one at Norfolk to care for the center; and one at Guantanamo, Cuba—the key to the waters around the Panama canal, as Gibraltar is the key to the Mediterranean.

"The chief and final move in any state is the largest possible distribution of wages to its citizens through its navy yard. Some very curious situations result from this condition.

"New Orleans, for example, was so unfortunate as to secure but $1,040.01's worth of work in the naval year of 1907. The cost of maintaining this station during that year was $97,178.49; while $308,332.35 more was expended, with rare optimism, on improvements. There were $41,644.37's worth of naval officers and enlisted men stationed about this establishment during that uneventful year; while $20,000's worth of marines guarded it day and night.

"Key West, in 1907, had an unusually busy year. It did $7,126.18's worth of work, against $3,109.94 the year before. Its maintenance charges amounted to $139,908.32, but it secured only $40,109.75 for improvements. It was, however, cared for by $48,882.36's worth of naval officers and sailors, and guarded by $12,000's worth of marines.

"The organization and arrangements of a government navy yard still assumes the principle on which it was founded and developed—that we are making wooden ships and equipping them with steam machinery and the other new mechanical devices which civilization has put into use since this system was established 70 years ago. When it began in 1842 the building, repairing and equipping of wooden ships in our navy yards were in charge of one manufacturing bureau. Then steam came and a bureau of steam engineering was established to put boilers into the wooden hulls. A bureau of equipment took charge of equipment at the same time. A civil engineering department has charge of the yards and docks; an ordnance department not only makes guns but has charge of fastening them to the ship. A bureau of supplies and accounts keeps the stores and books, and a high officer represents the military authority of the bureau of navigation. Each bureau takes the best it can get in the way of buildings and equipment; it makes its own plans, which may or may not fit into the plans of its neighbor, whose work is dependent on it.

"There are millions of dollars worth of wasted buildings and duplicated machinery in these plants. An inventory of the New York yard a few years ago showed 72 separate mechanical plants, 45 storehouses and sheds, and 50 outdoor stores of material.

"The Boston navy yard devotes itself largely to the manufacture of chains, anchors and cables. On May 9, 1906, George A. Loud, of the house naval committee, presented to congress a report showing that out of its total product of $925,000 there was a loss of $325,000 over the cost of the

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same articles at ruling commercial prices.

THE NAVY ON THE LAND.

"The American navy on the land employs from 25 to 50 per cent more men than the navy on the sea. Directly and indirectly it pays nearly twice as much in wages. It costs as much to maintain it, before a stroke of work is done, as to maintain the whole fleet at sea. Twice as many admirals, twice as many captains, three times as many commanders work for it.

"Now, every dollar taken by the political navy takes a dollar and more from the military navy. The officers of our ships know this perfectly well. And many of them see that unless this conscienceless waste of money is stopped there will be a great reaction, and the American people will shut down indiscriminately on naval appropriations as a whole. The first principle of reorganization of our navy must furnish some responsible and capable military body to direct it as a military department. This body should be small, compact, and responsible; the highest honor in the service, and composed of the most vigorous and capable minds it affords. Such a board would demand in the first place a fighting fleet. It would map out the shore stations demanded from a strictly military standpoint. Two-thirds of our navy yards would be abolished. It would secure the development of the navy yards toward the purposes for which they exist; that is, as naval bases.

"The physical plants of the navy yards should be reformed in accordance with their main functions—first, the repairing, and second, the fitting out of ships. The organization should then be fitted to the process; not the process to the organization, as now. And the best mechanical talent the navy possesses should be placed in charge of a unified system of manufacture."

It is expected to have the work of rebuilding the cruiser New York completed by April 1. The job is being done at the Boston navy yard and when completed practically every part except the underwater body will be new. She has new boilers, of the latest water tube type, refrigerating systems, and new drainage and plumbing systems. The New York is to have four of the latest 8-in. rifles mounted in two turrets and her broadside battery may be of 5-in. guns instead of the old 4-in. type. Everything possible about the turrets and hoists is operated by electricity.

DESIGN AND CONSTRUCTION OF SHIPS.

"The Design and Construction of Ships." By Prof. John Harvard Biles. Vol. 1. 423 pages. 6 by 9 in., with 36 folding plates and 245 illustrations. Price, $7.50 net. Published by J. P. Lippincott, Philadelphia. For sale by the MARINE REVIEW.

This book is the result of many years of lecturing in Glasgow University by Prof. Biles. Though Prof. Biles admits that there is little in the book but what has been given at some time to the students, the chapters do not represent any systematic series of lectures. The lectures were never written as they were delivered, and new matter has necessarily been added to them. In the compilation of this work Prof. Biles lays no claim to originality. Nor does he attempt to acknowledge the sources of his help, as the science of naval architecture has become too wide to acknowledge all sources even if one were qualified to do so. In the preparation of the work Prof. Biles has been greatly assisted by the firms of Messrs. John Brown & Co. and Denny Bros., who placed at his disposal results of many of their investigations. While the book is primarily intended for young students, many practical men will find it of great assistance in their daily work. The book is divided into two volumes. Volume 1, however, is complete in itself and is divided into three parts, Part 1 dealing with areas, volumes and centers of gravity, Part 2 with ship calculations and Part 3 with strength.

OPPOSE BOUNDARY TREATY.

The new international waterways treaty gives promise of falling through altogether as it appears that it is satisfactory to neither the Canadians nor the citizens of the states bordering upon the great lakes. Senator Smith, of Michigan, has been given a hearing by the senate committee on foreign relations, at which time he contended that the treaty does not give adequate protection to the water power rights of the St. Mary's River.

The fisheries section of the treaty has fared even worse at the hands of those interested in that industry in Canada, who through the provincial governments of Ontario, Quebec, and New Brunswick, claim that their proprietary rights in the fisheries in their respective areas of the international waterways are being sequestrated.

The essential point of the treaty is that it throws the waters of both countries open to fishers of either country under license regulations controlled by a joint standing commission.

Besides the legal objection, the provincial fishery authorities claim that the Dominion government has been completely taken in by the American commissioners, who have thrown open to Canada only waters which have long since ceased to have good fishing value, while the Americans are admitted to the Georgian Bay, the Grand Manan grounds and other first-class fisheries, where they can fish from bases in American territory and control the American market, while the Canadian fisher is unable to enter the American market without duty.

TONNAGE OWNERS WILL ORGANIZE.

Driven to action by the depression in shipping and feeling the necessity for concerted effort, English shipowners recently held a meeting at Newcastle to take the first steps toward the formation of an international union of ship owners. The conference was attended by owners representing more than $50,000,000 worth of tonnage. Sir Walter Runciman presided. Not only is it intended to organize a union, or more properly an association, but also to adopt plans for improving the business generally and to make arrangements whereby competition will be less destructive and the supply of tonnage equalized to meet the demand of freight. Before adjourning the meeting left the matter of devising suitable plans in the hands of a committee.

The Sailingship Owners' International Union, which met in London last month, to consider conditions has issued an official circular confirming the rumor that the minimum grain rates from the North Pacific to the United Kingdom had been suspended from Jan. 1 to May 1, 1909. The minimum rates for ships that commence loading after May 1 remain the same as at the present, 27 shillings, 6 pence.

Showing the gloomy prospects of handling sailing ships at a profit, the announcement comes from Portland, Ore., that the owners of the British ship, Leyland Brothers, and the four-masted bark, Donna Francisca, have authorized their Portland agents to sell these vessels. Both of these ships arrived at Astoria last March and have been lying idle in the Columbia river since.

Charles W. Leavitt & Co. announce their removal after March 20 to the Hudson Terminal building, 30 Church street, New York.

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February 25, 1909.

A SHAMEFUL THING.

Stockholders of the Boston Steamship Co. this morning voted unanimously to liquidate. The company's $530,000 of 5 per cent bonds have been retired at par, as have also the $921,000 notes, leaving only minor current expenses still to be paid. The stockholders will get nothing in liquidation. The failure was the result of inability to compete with the Japanese and the Canadian Pacific lines which get subsidies from the Japanese and the Canadian governments.

The daily papers of February 15 carried the above news item. How much longer will evidence of this sort have to accumulate before the federal government comes to the rescue? How many more houses have got to tumble about our ears before we can see the point? The Boston Steamship Co. made a gallant fight to establish itself upon the Pacific ocean. It gave orders for five steamships at a time when it seemed certain that congress would extend sufficient aid to shipping to overcome the handicap imposed upon the American fleet through the higher wage scale that it has to pay, as well as the subsidies of other countries that it has to combat. These ships were built by the Maryland Steel Co., Sparrow's Point, Md., and are among the most admirable specimens of marine architecture afloat. They were sent to the Pacific in great faith. The roseate promises, however, were not forthcoming. The ships were operated steadily at a loss. The stockholders continued to meet the deficit until their funds were exhausted. They have lost everything, even the value of their stock. The vessels have been withdrawn from the trade and sold. No other nation under heaven would permit such a thing as this to happen. It isn't a square deal.

Major General J. Franklin Bell, chief of staff, U. S. A., addressing the members of the National Guard Association of the State of New York, declared that in his judgment the prospects of war in the future are greater than they have been in the past. "I am no glutton for war," said the general, "but if war must come I want to see my country as well prepared as it is possible to be."

General Bell discussed the lack of military policy in the United States and the need of preparation for war. "I hope our country may never be involved in trouble," he said, but added that it was gratifying to know that preparations were being made.

"We are proud of our fleet," he continued, "proud that it has circled the globe. Stud, if that fleet had started from Hampton Roads in time of war it would have been very difficult if not impossible to transfer itself to the Pacific." Lack of coal stations, colliers and other difficulties, would have been encountered, he said, which would have made this voyage almost impossible.

There is a total lack of preparedness for war. This nation no longer enjoys the splendid isolation of the past. It should be prepared for every emergency and no one can tell when war will break out. No sane person would have predicted a war with Spain and yet it came with remarkable swiftness. Insignificant as that war was, it was a long time before transports could be secured to move the troops. Had it been a war with any considerable power, involving much cruising, the outcome might have been in doubt. Certainly we are not in position to carry on any over-sea movements and will not be until we have a merchant marine as an auxiliary to the navy. No other nation takes the chances that the United States does. Great Britain does not hesitate for a minute to spend enormous sums of money to maintain an adequate naval reserve. The Mauretania and Lusitania, the two most magnificent steamships in the world, were built with funds loaned by the British government and are in every sense of the word auxiliary cruisers, faster than anything afloat and capable of harassing an enemy to the last degree. These are the kind of ships that the United States should have. It is a short sighted policy that it hasn't them.

WILL WIRELESS BE COMPULSORY?

The result of the prominent part played by wireless telegraphy in the Republic-Florida collision has already begun to take significant form, as a bill was introduced in the house of representatives on Jan. 26 by James F. Burke, of Pennsylvania, providing that all vessels carrying 50 or more passengers and going on journeys of 500 miles or more, must be fitted with wireless apparatus, clearance to be refused to such vessels as fail to comply with the law. The bill provides that foreign vessels not equipped with wireless shall be refused admission to American ports.

Steamship men in general are in favor of such legislation, as they have long recognized the great value of the service to them, as well as to the traveling public. The greatest difficulty to be overcome now seems to be the establishment of some agreement whereby the three wireless services, viz., government, Marconi and United Wireless, can be made to work in unison, instead of, as is now the case, refusing to accept each other's messages except in cases of distressed vessels. The Atlantic liners use the Marconi system, the steamship companies providing board and lodging to the operators in exchange for the use of the system for company business and the Marconi company is left to make what profit it can out of private messages. In the winter, when few first cabin passengers are crossing, it is plain that the company will do a small business. The Marconi company now wants the steamship companies to pay it $1,000 a year in addition, for each installation aboard ship, and it is thought that the steamship lines will offer small objection to this if the system can be made universal. Certainly the wreck of the Republic has brought the necessity of wireless equipment on passenger ships acutely to mind. Had it not been for the wireless the loss of life might have been appalling.

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Navigation Rules of the Great Lakes Protective Association.

The advisory committee of the Great Lakes Protective Association has drafted a set of rules to be observed in navigating ships on the great lakes. These rules have been submitted to President Livingstone of the Lake Carriers' Association with the request that he submit them to the executive committee of that organization for their approval. The rules as drafted by the advisory committee are practical and sensible and if carried out, will reduce accidents on the great lakes to a minimum. The rules are as follows:

"The largest item of expense in the operation of ships on the great lakes is the cost of repairs by reason of accident. This has resulted in the rate of premium on hull insurance having been increased until it has reached a point where this insurance is nearly prohibitive and has forced the owners and managers of lake vessels to give this matter most serious consideration. In an endeavor to see if something cannot be done to reduce the number of accidents and thereby decrease the rate of insurance the inter-insurance scheme is being put in operation, and we earnestly call the attention of owners and managers and the executive officers on the ships to the following recommendations looking toward the safety of the property:

"No boats shall load deeper than the draft of water posted by the Lake Carriers' Association at the different loading docks, and the marks on every ship shall be carefully checked up the next time the ship is placed in drydock, and if she has no amidship marks the same shall be marked.

"A wreck or damage report shall be made out by the captain of the ship and promptly forwarded to the secretary in every case of accident or damage to his own or any other ship or structure. Because the captain believes his ship sustained no damage will not excuse him from making out a report and promptly mailing it on completion of the trip.

"In case any ship loses an anchor in any harbor it shall first be marked and if there are tugs in the port they should be notified and warnings of the obstruction be given to all incoming and outgoing vessels and the captain shall immediately notify the secretary by telephone or telegraph.

"In case of losing an anchor in a channel in the rivers where it will be an obstruction to navigation, before leaving the vicinity the captain shall mark the location where it was lost and telegraph the secretary from the nearest station, also notifying the representative of the Lake Carriers' Association in the vicinity of the obstruction. If in the vicinity of Amherstburg he should notify Duff & Gatfield and President Livingstone and if in the Detroit and St. Clair rivers, notify Mr. Livingstone. If in the Soo river or vicinity the representative of the Lake Carriers' Association at the Soo should be notified.

"Great care must be exercised in boats leaving the Soo or the lower end of the Detroit river after having been held up on account of low water or fog and steamers with tows should permit lone steamers to go ahead.

"Every navigating officer should thoroughly familiarize himself with the pilot rules, which must be carried out to the letter, and, as further safeguarding the navigation of the ships, we emphasize the necessity for great care.

"1. Don't forget to find the bottom with the lead line in case you do not know where you are in thick weather, as that is much cheaper than finding it with the bottom of the steamboat.

"2. Don't attempt to pass another steamer going in the same direction without the proper exchange of signals and unless there is plenty of room for the maneuver.

"3. Don't draw up too close to another boat going in the same direction without you have first received permission to pass. A half a mile is a good safe distance, and means you are about four minutes behind him.

"4. Don't try to pass another boat going in the same direction on a bend in the channel, or when you are likely to meet another boat during the maneuver.

"5. Don't forget to blow at all times the proper signals provided by law. Don't forget to blow the alarm signal when necessary.

"6. Don't take your half of the channel right out of the middle. Give the other fellow a chance.

"7. Don't forget to report to the local inspectors any violation of the pilot rules, as the lives of your crew and the safety of your ship depends on these rules being carried out. Send a copy of such reports to the secretary.

"8. Don't forget to give an approaching vessel plenty of room. Don't worship the ranges—they are not sacred. Learn where the deep water is and how to use it.

"9. Don't be tempted to imitate the example of masters who are disposed to hurry or crowd and never let false pride or temper lead you into doing a thing just to get back at the other fellow. Your ship contributes to the other fellow's loss or damage in the cost of her insurance.

"10. Don't forget whenever you are in doubt between two courses of conduct, to choose the safe one instead of the one that might possibly gain a little time.

"11. Don't forget that an absolute record is being kept of all accidents, and may have some bearing on your future."

PIG IRON SITUATION.

Considerable confusion has been caused naturally by the declaration of the open market in steel prices. Something of the spirit of co-operation developed during the 15 months' campaign for the maintenance of prices is still, however, a factor, and while it is probable that bottom quotations have not yet been reached, there is a tendency among leading interests to co-operate. This shows, in fact, that many companies are naming about the same prices. A readjustment of wages seems inevitable. Much of the confusion is due to the tendency to abandon Pittsburg as the sole basing point in favor of making both Chicago and Pittsburg basing points, as well as to changes in prices. Very little new business has developed since price reductions were made. The new prices on finished material show reductions as follows: Bars, hoops and bands, $4 a ton; plates and shapes, $6; sheets, $3 to $5; ware, $1; steel pipe, $6 to $10; boiler tubes, $6 to $10; wrought iron pipe, $2 to $4. At the present time little effect has been had upon the pig iron market; it is dull with a tendency toward softness. The coke market continues dull with low prices named for prompt delivery.

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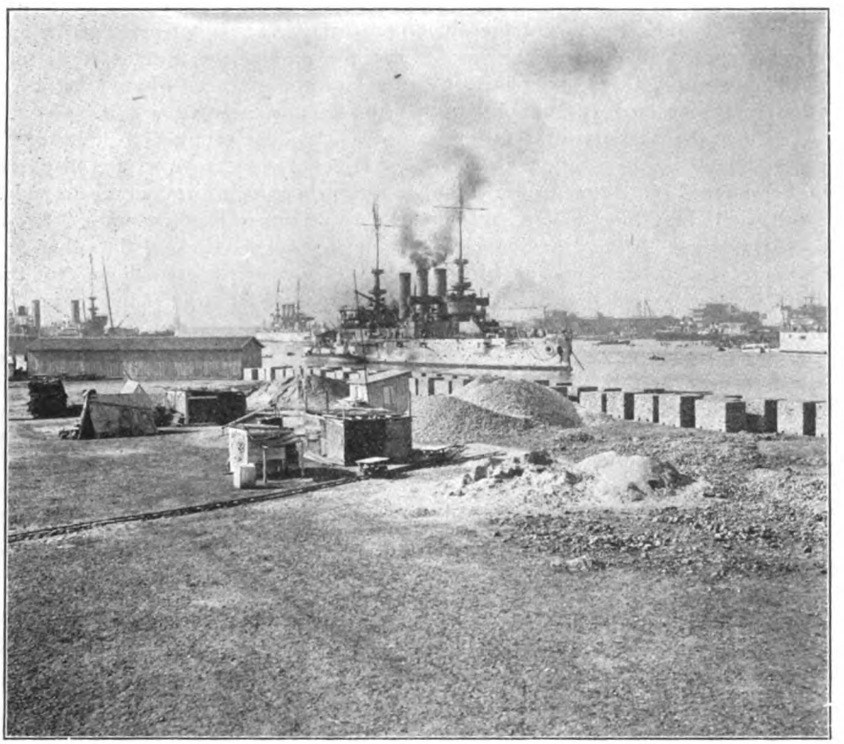
COALING AT PORT SAID.

The United States battleship fleet were coaled at Port Said on the return trip home. The work of coaling occupied from Jan. 4 to Jan. 12 and was conducted by the British Coaling Depots, whose American agents are the Chesapeake & Ohio Coal & Coke Co., 165 Broadway, New York.



UNITED STATES BATTLESHIP FLEET AT PORT SAID.

The vessels coaled were the battleships Connecticut, Vermont, Kansas, Minnesota, Louisiana, Virginia, Missouri, Kentucky, Ohio, Georgia, Nebraska, New Jersey, Rhode Island, Wisconsin, Illinois, and Kearsarge, and the auxiliaries Yankton, Colgoa, Ajax and Panther. The ships left as fast as they filled their bunkers. The first vessels to get away were ordered to Messina and Naples to assist in the relief of the earthquake refugees. The quantity of coal supplied was as follows: Yankton, 90 tons; Colgoa, 655 tons; Connecticut, 1,443 tons; Vermont, 1,489 tons; Kansas, 1,760 tons; Minnesota, 1,700 tons; Louisiana, 1,927 tons; Virginia, 1,520 tons; Missouri, 1,496 tons; Kentucky, 1,002 tons; Ohio, 1,658 tons; Georgia, 1,540 tons; Nebraska, 1,286 tons; New Jersey, 1,803 tons; Rhode Island, 1,507 tons; Wisconsin, 901 tons; Illinois, 1,113 tons; Kearsarge, 1,244 tons and Panther, 684 tons. The coal was put aboard by native gangs at the rate of about 100 tons an hour. The fleet constituted the largest war fleet that has ever passed through the Suez canal, the canal dues amounting to about $130,000.

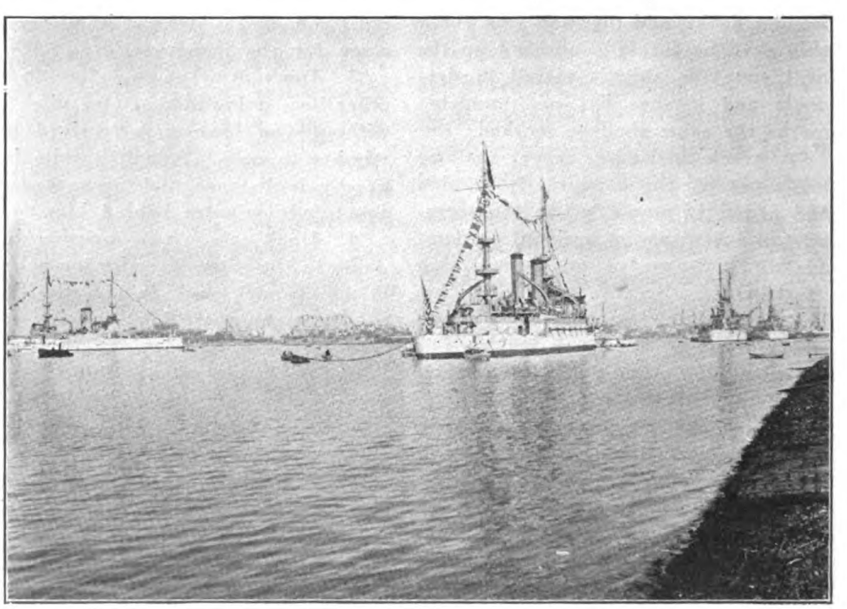
WIRELESS TELEPHONY CRITICISED.

The wireless telephone has been reported as having proved of less use than was anticipated during the world cruise of the Atlantic battleship fleet.

It is not known that the navy department has decided to discard the wireless telephone installations but it is admitted that they have fallen into disuse. Lee de Forest, inventor of the system on board the vessels of the fleet, states that orders have been issued that all interfleet communication should be carried on by wireless telephony instead of by wireless, and that he has known of no complaint concerning the value of the system.

Since the fitting of the apparatus to the battleship fleet there have been several improvements and the company which has been formed to exploit the invention is at present giving particular attention to perfecting the device for use on shipboard.

The chief difficulty with wireless telephony seems to be that when in use it precludes absolutely the use of the wireless telegraph. The telegraph has a much wider range of usefulness and can be called on in all kinds of weather, so that ship commanders are more favorably disposed toward it than toward the telephone. The wireless telephone is in its infancy yet, however, and officers of the bureau of equipment are at work seeking to overcome the defects that now make it second in importance to the telegraph. Under certain conditions, it is pointed out, the use of wireless telephony, provided the apparatus can be perfected, will be of even greater value than the telegraph. This might be the case in the course of naval engagements or when executing intricate maneuvers.



UNITED STATES BATTLESHIP FLEET AT PORT SAID.

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TOWING MACHINES FOR THE PANAMA CANAL.

In connection with the construction of the great dam at Gatun, there will be required a series of three large locks in order to raise and lower the vessels between the sea level and the 85-ft. level of the proposd Gatun lake. There will also be a large spill-way for carrying away the excess water delivered by the Chagres and other rivers that will keep the lake full. In the rainy season this overflow may be of large volume; hence the necessity for strong construction of the spill-way to withstand erosion. The quantity of concrete to be used in the lock and spill-way construction will be enormous. One million barrels of Portland cement have already been contracted for.

The concrete, of course, will be mixed on the works, and the problem of supplying the necessary sand and gravel is a large one. There is no sand or gravel on the canal zone, so it has to be brought from other parts of the coast. The Isthmian Canal Commission has established a plant at Porto Bello, 40 miles away, and another at Nombre di Dios, 20 miles away, for supplying rock. The material brought from Porto Bello and Nombre di Dios will be transported in large sea-going barges. The fleet for this work now consists of three tugs and fourteen barges, and it is expected that they will be taxed to their utmost capacity to keep the operations in full blast after the lock construction is under way.

The weather conditions prevailing on the Atlantic coast near Colon are extremely trying for towing gear. There is nearly always a heavy swell rolling in from the Carribean Sea. This swell plays havoc with the lines of the towing vessels, and when there is a "norther" blowing it is impossible to do any towing in the harbor of Colon. This swell is also a serious problem to the fleet of tugs and "clapets" which are engaged in towing the dredged material from the sea level portion of the canal out to sea. A "clapet" is a self-propelled dumping barge, one of the many souvenirs of French regime that the Americans are using to good advantage. This portion of the canal is to be about 9 miles long, 500 ft. wide and 40 ft. deep, so that the material removed will, of itself, be enough to keep a towing fleet busy with its disposition.

Neither of these towing operations, either for the dredge or for the transportation of lock material, can afford to be disturbed by weather conditions. Any delay in the lock construction especially would seriously interfere with the promised opening of the canal on Jan. 1, 1915. The army officials, realizing the importance of being able to tow to the best advantage in all weathers, have adopted automatic steam towing machines for this service. They are installing 12 "Providence" towing machines for this work on the Atlantic side. Each of the tugs will carry a machine and one-half the barges will also be equipped with the "Providence" towing machine.

The makeup of the tows between Colon and Porto Bello or Nombre di Dios will consist of one tug and two barges, the second of the barges being equipped with a towing machine. This arrangement allows an elastic connection not only between the tug and the first barge, but also between the first and second barges. The towing machine on the tug will, of course, have the strain of towing both barges and will give and take as required by the plunging of the tug and first barge. The line from the first barge is held by the second barge on its towing machine which is located forward. The second and third barges may thus plunge freely without danger of breaking lines.

The use of towing machines for this work will not only allow the work to progress in all weather, but will increase the speed of the towing. Even when it was possible to tow with fixed hawsers, the shock of the heavily laden barges fetching up on the lines caused the tug to be materially retarded, or even stopped, so that it had to regain headway after the strain was relieved. The breakage of lines in this service has been enormous, and this, of course, was accompanied by serious risk of damage and loss of life and property.

The harbor of Porto Bello also offers some trying problems, and it is necessary to have the vessel absolutely under control in entering or leaving. An instance of this was a recent loss of a large government dredge which broke adrift while being towed into the harbor. This feature of maintaining control over the tows while entering and leaving the harbor is one of the most important wherever rough weather is encountered.

The losses and difficulties in connection with the towing of the lock material on the Atlantic side at one time caused the engineers so much concern that they proposed to obtain all their material from the Pacific side and then ship it across to Gatun by rail. The water on the Pacific side is comparatively smooth. The installation of the "Providence" towing machines, however, has changed conditions to such an extent that the engineers need no longer consider the expense and delay that would be entailed by taking material from the Pacific side.

FORE RIVER CO.'S YEAR.

President Francis T. Bowles, of the Fore River Ship Building Co., of Quincy, Mass., in his annual report to the stockholders of that corporation says: "Additions to the plant and machinery were made during the year to the amount of $70,000. All items of repair and maintenance have been charged to expense and the surplus has increased by $91,982. The cash receipts for the year amounted to $6,077,793. The following vessels were under construction on December 31, 1908: Battleship North Dakota, seven submarine boats, eight army tugs, three steel carfloats, one harbor transfer tug, two torpedo boat destroyers. During the year there have been completed and delivered scout cruiser Birmingham, scout cruiser Salem, steel collier Melrose, steel freight steamer Altamaha, four steel light vessels, one steel harbor tug and four steel carfloats.

"We have continued to make reduction in the cost of product and are prepared to meet the competition of other shipyards, which owing to the scarcity of work is at the present time most keen. The company has secured an exclusive license for the United States for the Curtis marine turbine, which has shown excellent results in the performance of the scout cruiser Salem."

The balance sheet as of December 31 last compares with the previous years as follows:

ASSETS.	Dec. 31, 1908.	Dec. 31, 1907.
Real estate, buildings, etc.	$2,327,218	$2,327,753
Machinery, equipment, etc.	1,258,428	1,293,237
Investments	90,000	24,762
Total	$3,675,646	$3,645,752
Less depreciation	120,000	120,000
	$3,555,646	$3,525,752
Reserve accounts receivable	168,508	143,956
Unearned ins.	12,330	17,823
Unearned taxes	.....	8,223
Accrued interest	199	8,171
Work in process	206,938	430,716
Materials on hand	267,013	306,896
Accounts receivable	338,866	307,874
Cash on hand	864,164	281,262
Total	$5,413,664	$5,030,673
LIABILITIES.		
Preferred stock	$2,400,000	$2,400,000
Common stock	2,400,000	2,400,000
Accounts payable, res.	24,960	65,120
Unearned rentals	3,750	6,750
Accrued taxes	16,044	.....
Uncompleted contracts res.	225,193	.....
Accounts payable	225,518	132,586
Surplus	118,199	26,217
Total	$5,413,664	$5,030,673

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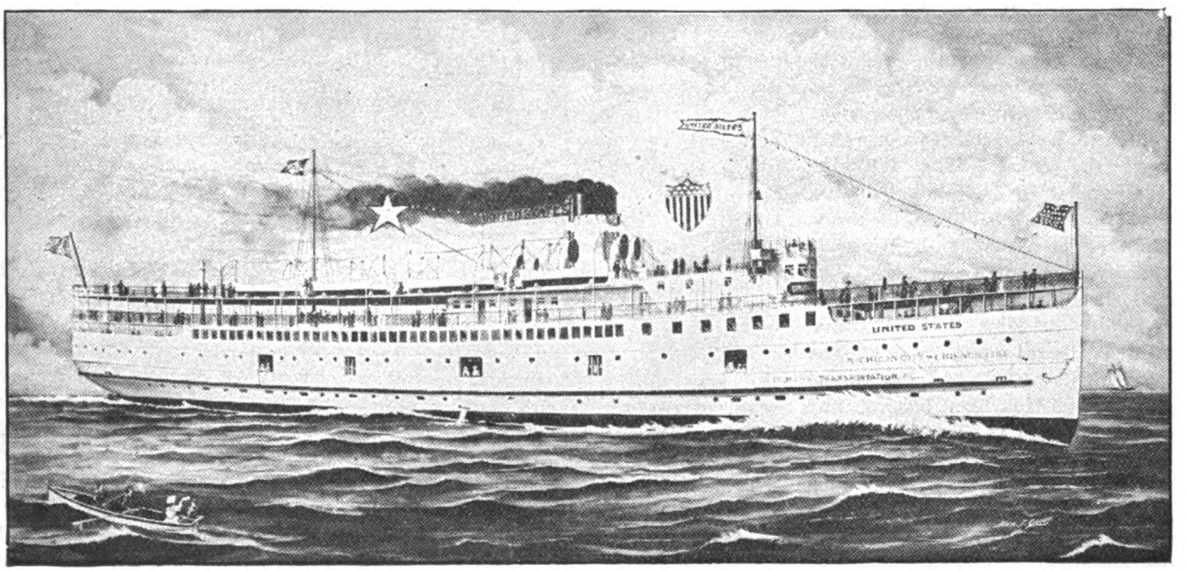
STEAMER UNITED STATES LAUNCHED.

The passenger steamer United States, building for the Indiana Transportation Co., was launched from the yard of the Manitowoc Dry Dock Co., Manitowoc, Wis., on Feb. 22, and was christened by Miss Blanche Rose Boehm, of St. Louis. At the conclusion of the launching luncheon was served in the mold loft.

The United States is 215 ft. long, 40 ft. beam and 17 ft. deep. She has five decks and measures over 42 ft. in height from keel to bridge. She is built under the supervision of the Great Lakes Register. The United States is of staunch construction, the bulwarks on sides of the ship being steel, forming part of the cabin and extending up to the promenade deck. Steel deck beams, belt frames and stanchions continue up and across the hurricane deck and texas. The hull is divided into five water-tight compartments. Leading up from the cabin to the main deck aft as well as forward are four separate side stairways intended to better facilitate the movement of crowds than the present single center stairway method. The cabin is especially large and is intended to accommodate large gatherings. Battleship linoleum is laid on the floors instead of carpet in order to provide a surface for dancing. The steamer is equipped with wireless telephone and telegraph stations and has all the latest life saving devices.

The engine is triple-expansion with cylinders 22, 36½ and 60-in. diameters by 40-in. stroke, supplied with steam from three Scotch boilers 13 ft. 3 in. by 12 ft. 4 in. Her auxiliary equipment is quite complete, including two k. w. turbine generators for the lighting plant.



THE STEAMER UNITED STATES AS SHE WILL LOOK WHEN COMPLETED.

LAKE VESSELS EXEMPT.

The interstate commerce commission has decided that carriers of interstate commerce by water are subject to the act to regulate commerce only in respect of traffic transported under a common control, management or arrangement with a rail carrier and in respect of traffic not so transported they are exempt from its provisions.

The decision is understood to mean that local business of a steamboat line beginning and ending carriage at termini of that line does not come within the operation of the law.

Regarding the law as to passenger and package freight lines an opinion given by Harvey D. Goulder, counsel of the Lake Carriers' Association in August, 1906, said:

1. Such of these as run between fixed termini and hold themselves out to carry generally for the public are doubtless included in the term "common carriers" as intended in this law. As to their business carried in connection with railroads upon a through, joint route, with through rate divided among the successive carriers, either for the carriage of passangers or goods they must comply with the various provisions of the law applicable to their business.

2. A question of difficulty upon which contrariety of opinion may be expected concerns the carriage of property from a point in one state to a point in some other or foreign country, which carriage begins and ends with such water line, with no through routing and no through rates.

Agreeing with previous decisions, the law expressly says that business which in its character is in fact through business may not be interrupted for the purpose of avoiding the provisions of the act. As to this class of business, passenger and freight, taking into account the purpoe and the intended application of the law, as specified in the opening section especially, and elsewhere throughout the act, my opinion is that, granting such water transportation company to be a common carrier, business local to its own line, in good faith beginning and ending its carriage at termini of that line, even if it does pass from one state to another, does not come within the operation of the law, nothwithstanding the same lake carrier may at the same time carry other business on through routing and joint rates, as to which it is within the provisions of the law.

M'ARTHUR PORTABLE FIRE ESCAPE.

The McArthur portable fire escape, manufactured by the McArthur Portable Fire Escape Co., Cleveland, O., has many things to commend it to lake interests. It can be rolled up and stowed away when not in use and is practically indestructible. The ladder has received unstinted endorsement wherever tried.

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AROUND THE GREAT LAKES.

Mr. and Mrs. James C. Wallace have gone to Atlantic City to spend a few weeks.

A joint conference of seamen, marine firemen and cooks unions will be held in Chicago, Jan. 18.

The steamer Bermuda of the Davidson fleet has been sold to H. A. Clark, of Brockville, Ont.

The steamer E. J. Buffington, building at the Lorain yard of the American Ship Building Co., will be launched March 6.

The supervising inspectors of steamboats are now in annual session at Washington. The sessions will probably last a month.

Walton H. McGean, accompanied by his brother John A. McGean, president of the American Linseed Co., is touring Cuba.

James T. McMillan, of Detroit, has been appointed assistant general manager of the Detroit & Cleveland Navigation Co.

The steamer Canisteo, owned by W. J. Clark, of Toledo, has been sold to A. Jacques & Sons, of Duluth. It is understood that she will enter the sand, gravel and building stone trade.

The barge Jeremiah Godfrey has been sold by Wm. Flumer to the Grace Harbor Lumber Co., of Detroit.

The steamer Naomi of the Crosby Line will be remodeled at the yard of the Manitowoc Dry Dock Co., Manitowoc, Wis., this winter.

Gilbert Patterson, formerly fleet engineer for G. A. Tomlinson, has been appointed fleet engineer for the United States Transportation Co.

Capt. Robert Reid, assistant inspector of hulls at Chicago, has been appointed inspector of hulls at Grand Haven.

The keel of the first of the package freighters for the Mutual Transit Co. has been laid at the Ecorse yard of the Great Lakes Engineering Works.

Capt. James Martin has resigned from the Ogdensburg Coal & Towing Co., to take command of the steamer Samuel Marshall, employed in lake and canal service.

President William Livingstone, of the Lake Carriers' Association, visited Cleveland on Tuesday enroute home from Pittsburg, where he had spent Washington's birthday.

John H. Galway, local United States inspector of boilers at Detroit, died on Feb. 8. He was about 61 years old and was at one time the national president of the Marine Engineers' Beneficial Association.

Col. Milton B. Adams, government engineer in charge of river and harbor work at Grand Rapids and vicinity, will retire on April 11, next. He will be succeeded temporarily by Major Charles Keller, corps of engineers, stationed at Detroit.

In the annual report of the department of railways and canals of the Dominion government, Deputy Minister Butler vigorously recommends the early enlargement of the Welland canal.

The vessel fleet owned by Comstock & Sinclair, of Duluth, is laid up as follows: Marine City, Mich., steamer O. T. Flint and schooner Arenac; Algonac, Mich., steamer Simon Langell and schooners W. K. Moore and Interlaken.

The bulk freighter Price McKinney broke from her moorings at Milwaukee last week as the result of a heavy swell coming up the river from the lake. She was caught by the tugs Meyer and Simpson. The damage will amount to $2,000.

A school of navigation is being conducted by the Y. M. C. A. of Duluth, under the direction of Mr. Frank Henrich, compass adjuster. A course of steam engineering is also offered under the supervision of Mr. Joseph F. Hayes.

The keel of the battleship Utah was laid at the yard of the New York Ship Building Co., Camden, N. J., on Washington's Birthday. The company plans to launch the battleship next January and to deliver her to the government within 18 months.

The Detroit River Iron Works, Detroit, Mich., has been awarded the contract for repairing the lighthouse tender Crocus, on its bid of $813. Other bids were: Detroit Shipbuilding Co., Detroit, Mich., $875; Great Lakes Engineering Works, Detroit, Mich., $1,150.

Mr. Howard I. Shepherd and Lieut. Col. Millis, government engineer, visited Washington to urge an appropriation for the improvement of Toledo harbor. Mr. Burton, chairman of the committee on rivers and harbors, has promised that Toledo shall receive $50,000 for the continuation of the 23-ft. channel.

Capt. John Mitchell, of Cleveland, and Capt. J. J. Rardon, of Chicago, who acted as arbitrators in the Lackawanna-Paisley case have awarded the Lackawanna $500 for towing the Paisley into port. The Lackawanna picked up the Paisley about four miles off Sand Beach and towed her to Port Huron. The Anchor Line, operating the Lackawanna, put in a claim for salvage, but Capt. James Davidson, owner of the Paisley, thought the amount asked too high. Harvey D. Goulder represented the Anchor Line and H. A. Kelley the interests of Capt. Davidson. The incident recalls the strange disappearance of the captain of the Paisley. As soon as the barge reached Port Huron he went ashore and has not been seen since.

The International Dredge Workers Protective Association in session at Detroit, has elected the following officers: Claud Wirth, president; John B. Sullivan, Amherstburg, first vice president; B. Fenaughty, Buffalo, second vice president; George Dehant, Chicago, third vice president; Frank McKinnon, Superior, fourth vice president; Albert Eagle, Sault Ste. Marie, secretary and treasurer.

The Farrar Transportation Co., Collingwood, Ont., held its annual meeting recently. Officers and directors elected were as follows: President, D. D. Lewis, Sault Ste Marie, Ont.; vice president, T. I. Thompson, Owen Sound, Ont.; managing director and secretary-treasurer, G. E. Fair, Collingowod, Ont.; other directors, E. R. Wayland, W. E. Allen, W. R. Rowland, E. Stubbs, M. Snetsinger, C. A. Farrar and F. Scott.

William A. Lydon, president of the Great Lakes Dredge & Dock Co., has given an order to the Pusey & Jones Co., Wilmington, Del., for an ocean-going steam yacht to be 170 ft. over all, 132 ft. keel, 21 ft. 8 in. beam and 10 ft. draught. She will be schooner-rigged; constructed entirely of steel and divided into six water-tight compartments. William Gardner of New York will design her.

The two package freighters building for the Mutual Transit Co. by the Great Lakes Engineering Works will be named Northlake and Northsea.

Mr. Frank S. Masten, of the firm of Goulder, Holding & Masten, who was operated upon at the Harper Hospital in Detroit for appendicitis about a month ago, returned to Cleveland last week. He was met at the depot by a numer of vessel owners.

At the meeting of the directors of the Great Lakes Towing Co., the old officers were re-elected as follows: Gen. George A. Garretson, chairman of the board; H. G. Dalton, vice chairman of the board; Edward Smith, president and treasurer; Capt. Thomas Johnson, assistant to the president; Capt. James Davidson, first vice president; Capt. A. B. Wolvin, second vice president; T. F. Newman, third vice president; M. H. Wardwell, secretary and assistant treasurer.

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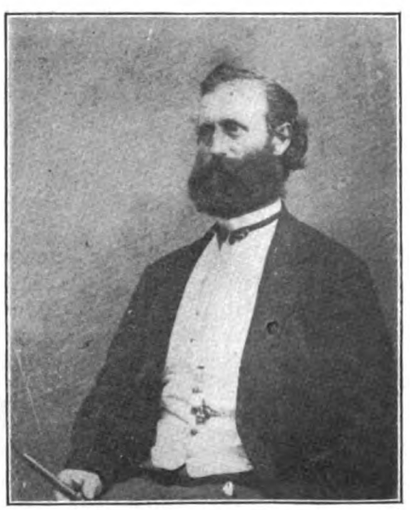
James M. Kelley, A Lake Superior Poneer.

James M. Kelley, now living at Belvedere, Cal., at the age of 82 years, was one of the original patry that went from Worcester, Mass., in 1849, to develop the iron mines that had recently been discovered in the Lake Superior country. He has two sons and a daughter living, Fred W. Kelley, publisher of the *Breeder and Sportsman,* San Francisco; James H. Kelley, real estate dealer of Belvedere; and Mrs. S. H. Woodbury, Chicago.

Mr. Kelley's party arrived at Marquette a few days after Peter White's party had reached there from Mackinac island. He was requested by the MARINE REVIEW a few weeks ago to give an account of his journey to



JAMES M. KELLEY.
From a photograph taken in 1859.

the iron mines from Massachusetts. His account, written in 1909, of what occurred in 1849, is extremely valuable. Mr. Kelley's recital is as follows:

In 1849 I left Boston where I had been employed in Simmons and Mackintyre's Church Organ Manufactory and went to Worcester. I went to work with Freeman Upham in building a mansion for William A. Draper, a wealthy banker and prominent citizen of Worcester.

In the winter of 1848 Robert J. Graveraet arrived at Worcester with specimens of iron from Lake Superior which were tested at the Washburn Wire Works. Wire was drawn direct from the bloom which was said to be equal to the wire from the best refined iron. W. A. Draper, Amos R. Harlow, Mr. Coey, R. J. Graveraet, Waterman A. Fisher and others incorporated the company and at once commenced getting machinery ready to ship in the spring. Mr. Upham was asked by Draper to go to Lake Superior as superintendent of building, but Upham said he could not go. He had just been married and was elected one of the aldermen of the city. He recommended me to the company saying that I was as competent for the position as himself. May 8th, 1849, I signed an agreement for one year to go to Carp River, Lake Superior, and put up the buildings. Our machinery was shipped to Buffalo by canal, and about the middle of May our party consisting of Mr. Harlow agent, Coey machinist, Elias Gates engineer, Edward Clark and J. M. Kelley, started for Buffalo by rail.

From Albany to Buffalo we made very slow progress, as the road was owned by several different companies and occasionally failed to make connections (no through tickets). We had to change cars, buy tickets, change baggage, at several towns on the way. The railroad track a part of the way was a strap of iron spiked on wooden stringers. Had to stop over night at Canandaigua. We left Harlow and family there to come on later. Finally we arrived at Buffalo, and from there to Detroit by steamer Illinois, a very pleasant trip. We put up at the American Exchange Hotel, Hawly Lyon, proprietor, and waited for our freight to arrive.

As Detroit at that time was in danger of a visitation of the cholera, Mr. Gates and I went by steamer to the Soo where we spent a week or two fighting mosquitoes, fishing, and watching Indians run the rapids. I asked our landlord how the people got their living there. He said with a wink, "In summer we skin strangers, in the winter we skin one another."

About the last of June our supplies and machinery arrived and Shelden McKnight, freight agent, had them hauled over the portage (there was no canal then—only a dry ditch, the remains of an abandoned effort to dig a canal). Our goods were loaded on the schooner Fur Trader, Captain Ripley, and we sailed for Carp River. We had a very pleasant voyage up the lake. July 4th we were passing the Pictured Rocks and we celebrated with the aid of the barrel of "Old Rye" (which Ripley kept on deck with a tin coffee pot and cup) free for all. We had a jolly time. July 6th we passed Carp River and anchored about a mile above, near a rock (which we afterwards called Ripley's Rock) in a small bay and landed our freight on the shore, everything, supplies, boiler, engine, portable saw mill, and machinery.

We were met here by a party of young men who had come up from Mackinaw with a fine large boat, a most welcome addition to our party. They were Peter White, James Chapman, Wayne Graveraet and Henry Davenport, and from the Iron Mountains, John Mann, Capt. Moody and Dr. Rodgers.

We were now in the wilderness. The nearest white people were a

JAMES M. KELLEY.
From a photograph taken in 1905.

few men at the Jackson Iron Works eight or nine miles from the shore, the missions at L'Anse, about forty miles north, and Mr. Williams and family about the same distance south at Grand Island. Our party now consisted of Coey, Gates, Harding (mill man), four Mackinaw boys, Mann, Moody, Rodgers, Robert Graveraet and myself.

I furnished them with axes, and in a few days made a clearing where now is the city of Marquette. At first our accommodations were very crude. Sometimes we slept on the shore and sometimes in camp. At Dead River we found a very good house made of squared timber or logs with shingled roof. It had been built and occupied by a New York company who prospected for gold in that vicinity but found nothing

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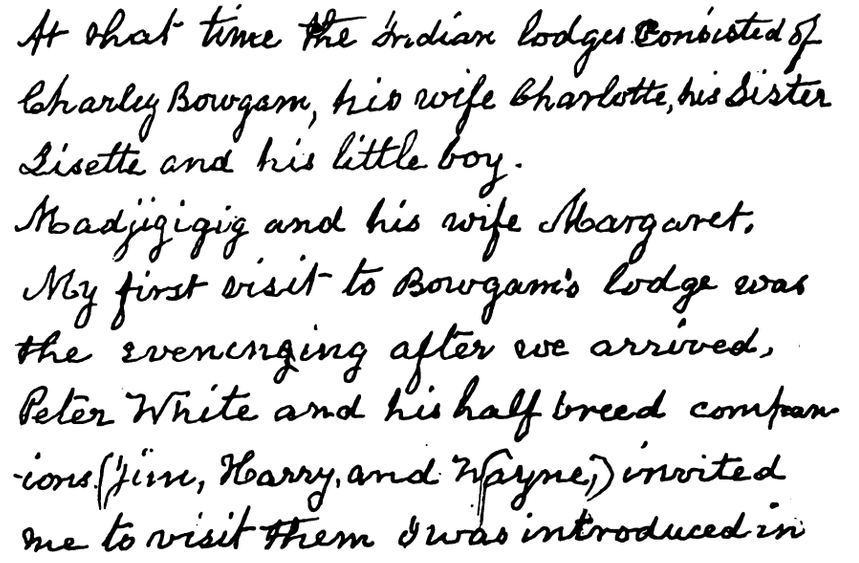
more valuable than iron pyrites (fools' gold), and left for home. I concluded to move the house to our location to accommodate Mr. Harlow and his family.

The next morning we went to Dead River in our boat, took the house apart and rafted the logs and roof. While towing it when about half way home we met a violent thunderstorm. Twice the raft broke away but finally we got it safe to Worcester (as we named it then) our location where we rebuilt it. We built a large log house for the men Graveraet had gone to Milwaukee to hire, and then one for our own party which we named "Revere House." After I had put up a frame of hewed timber for the power house and machine shop, we set the engine and boiler, put up the shafting and pulleys and connected to the portable saw mill with 4-ft. circular saw to make lumber and shingles to cover the buildings (the said shingles were 5 ft. long).

I shall never forget the day we started the mill. The Indians both male and female were there astonished and delighted. They went to the engine and looked at Gates, then to the mill to see Harding and Sawyer, then came to me and seemed to wonder how I could do such a mighty thing. They were my good friends always.

Soon after we arrived Bawgam's little child died. Peter White came to me and asked if I could make a coffin for it. Said they would be very grateful if I would. I made it of boards from packing boxes and stained it with some red chalk. They were very grateful and said "Meguech, Meguech" (many thanks).

At that time the Indian lodges consisted of Charley Bawgam, his wife Charlotte, his sister Lisette and his little boy, Madjigigig and his wife Margaret. My first visit to Bawgam's lodge was the evening after we arrived. Peter White and his half breed companions (Jim, Harry and Wayne) invited me to visit them. I was introduced in due form. After a while I proposed to have a smoke and with a handful of cigars intending to pass them around, and as Charley, a chief's son, I offered to him first thinking he would take one. To my surprise he took them all and said "Meguech." I was about to explain but Peter told me not to do so. The joke was on me, and the boys enjoyed it. In the winter they had their feast and I was invited and went. I was at the seat of honor at the side of the Chief Shawano, Charley's father, who had come up from the "Soo" to preside at the feast. We had stewed venison, partridge, muskrat and beaver tail and roast dog. I ate of all but the muskrat and dog.



FAC-SIMILE OF JAMES M. KELLEY'S HAND WRITING AT THE AGE OF 82 YEARS.
(Written in 1909.)

Shawano (from the south) was a fine noble-looking man, the most powerful athletic man I ever saw. He was nearly six feet tall, but his immense breadth of shoulder and powerful limbs made him appear about medium height. His expression was dignified but friendly and intelligent. He gave Peter White his Indian name "Shobwa-wa" and myself he called "Shobwas-e-gay." The Indians do not use the white man's name when speaking of or to him, but use the Chippewa name. It is said of Shawano that he would take the entire contents of a barrel of pork, 200 lbs., in his pack and carry it when packing for the United States surveyors. The Indians were always my friends and honorable men. They would not lie, steal, drink whisky or swear; in fact did not know how to swear. (These vices belong to the white man.)

The Algonquin arrived soon after we did with the rest of our folks and I had a house ready for them. The party consisted of Mr. Amos Harlow, Mrs. Harlow and child, Mrs. Bacon, Mrs. Harlow's mother, Mr. Jacobs (a Cape Cod man—he came out to see the country), Mr. Harding, mill man, and Mr. and Mrs. Wheelock.

Silas (Saleratus) Smith, an old prospector, had about that time discovered a whet-stone ledge a short distance south of us and had commenced working on it. We had a horse that we had no use for, and sold it to the company. The horse "Jack" was Canadian breed commonly called Canuck pony. Hardy, gentle, and very useful, he would get his own living, would eat anything digestible, brows, bread, even salt pork scraps. He seemed to have no knowledge of hay or oats.

Robert Graveraet brought up a party of forty men from Milwaukee, mostly emigrants from Europe, some from Germany, Austria and Hungary, two from Holland and one Irishman. After landing ship fever developed among them. One of them died. The others recovered by the careful nursing of Peter White and Dr. Rodgers.

John Hardesty, a western man, had charge of them in the woods where we sent them to clear the land and make charcoal. After one day's experience with them he came to me and said he must give up the job, as his life was not safe among them because the men felled the trees in all directions. One was badly wounded in the back by a glancing blow of an axe, another had a foot badly cut. They were an ignorant lot. Few of them could speak English; two of the Prussians claimed to be counts in their own countries.

In the fall some of them were discontented and a plot was made to break into our store house, get provisions and steal our boat and go to the Soo. We found out what their plans were, and proposed to take them to a point where they could take the trail to Grand Island and from there to Bay de Nocquet. We furnished them with supplies and loaded them in our Mackinaw boat, Jim Chapman in the bow and White and Davenport in the stern with me.

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There were eight or ten of them and as I expected to have trouble with them told the boys that as soon as we landed the men and baggage to push out from shore as I knew they intended to take the boat from us and start down the lake. Chapman did as I had told him and sent the boat astern with a rush and lay on oars a short distance from the shore. They ordered us to come back and help them carry up their baggage and camp with them, and when we refused commenced cussing in German and very bad English.

We arrived home next morning and about a week afterward they were all back to the location again, a miserable looking lot, tired and hungry, said there was no Grand Island, could find no trail and had disagreed among themselves. We set them to work again and among our crew of laborers there were no better men. I have always been glad that I did not have to use the rifle that I had in the boat. In the winter word came to us that wolves were seen near the camp at the iron mountains and Bill Lemm went up and set some steel traps near the claims. One morning a trap was found sprung and a wolf's foot between its jaws. The wolf had gnawed it off and escaped. The next Sunday White rigged up a bobsled and Lemm and I went with him to the mountain. We found the trap sprung, but this time with a wolf in it who had but three paws. He was very humble and allowed us to tie his legs and jaws together. We used him for a foot stove on our way back to the lake. We had him chained to a tree near the lake and Lemm finally gave him to the steward of steamer Napoleon.

My first sight of wolves was on a hot Sunday in the summer. I went to the woods back of the location and come to an open space where the berries were plenty. While picking them I heard a slight noise. On looking around saw three grey wolves with their paws resting on a windfall about 20 yards from me and staring at me seemingly as much surprised as I was. I made up my mind that if they let me alone, I would not trouble them. I had a double-barrel shotgun and as they started back to the woods again I could not resist the temptation and let them have both charges of small shot which did not seem to worry them.

In the winter with the help of Peter White, Harding and a Hollander, I built the forge shop 150 ft. long, 50 ft. wide, 14 ft. high, put in a foundation of heavy timbers for the trip hammer. The building was planned for ten forges.

In the summer of 1850 Mr. Long arrived as general manager and as my agreement with the company was ended I concluded to go back to Boston. I engaged passage on the propeller Napoleon on the up trip to Cliff Mine, Eagle River, and Ontonagon, and back to the Soo, where I met some of our natives from the location who said that they came to bid me good-bye. Among them were old Margaret and Lisette.

DEPTHS OF WATER.

Following is a table of depths of water at entrance and at wharves and quays of all important ports in the world. The figures given are at mean high water. The table is compiled by E. Corthell, civil engineer:

Port and Country—	Channel depth, existing feet.	Quay depth, max. feet.
Aberdeen, Scotland	24	..
Alexandria, Egypt	30	26
Algiers, Algeria	72	22
Amsterdam (canal), Holland	30	30
Antwerp, Belgium	52	52
Auckland, New Zealand	43	36
Baltimore, United States	31.5	31.5
Bangor, United States	31	34
Barcelona, Spain	24	20
Barry Docks, England	29	29
Bath, United States	30	30
Belfast, Ireland	25.5	34.5
Bergen, Norway	27	27
Bilboa, Spain	23	27
Bizerta, Tunis	30	26
Boston, United States	36.6	36.6
Boulogne, France	28	..
Bremen, Germany	..	..
Bremerhaven, Germany	34	34
Brest, France	39	37
Brindisi, Italy	26	27
Bristol, England	39	37
Brunswick, United States	25.3	25.3
Buenos Ayres, Argentina	23.7	..
Calcutta, India	27.5	27
Cardiff, Wales	35	35
Cette, France	23	23
Charleston, United States	25	35
Cherbourg, France	Deep anchorage	..
Christiania, Norway	28	20
Civita Vecchia, Italy	28	13
Colon, Columbia	42	27
Columbia River, United States	36	--
Constantinople, Turkey	150	30
Constanza, Roumania	28	—
Copenhagen, Denmark	26	26
Corinth Canal, Greece	26	—
Danzig, Germany	22	13
Dieppe, France	28	23
Dublin, Ireland	26	35
Dundee, Scotland	31	31
Dunkirk, France	29	32
Fernandina, United States	29	29
Flume, Hungary	Deep entrance.	28
Galveston, United States	27.8	27.8
Genoa, Italy	52	30
Glasgow, Scotland	30	38
Greenock, Scotland	35	—
Halifax, Nova Scotia	83	45
Hamburg, Germany	24.6	34.6
Havre, France	30	—
Heyst (canal), Belgium	26.2	26.2
Hongkong, China	—	—
Hull, England	28	28
Kaiser William (canal) Germany	29.5	—
Key West, United States	30	—
Konigsberg (canal)	15	—
Leghorn, Italy	26	19
Leith, Scotland	25.5	27.5
Libau, Russia	22	28
Lisbon, Portugal	39	37.2
Liverpool, England	50	56
London, England	44	43
Lubeck, Germany	22.5	16
Malaga, Spain	30	23
Malmo, Sweden	22	21
Manchester (canal), England	26	26
Maracaibo, Venezuela	15.5	36.5
Marseilles, France	55	39
Melbourne, Australia	—	—
Messina, Italy	Deep anch.	Deep anch.
Middlesborough, England	33	—
Mobile, United States	25.6	23.6
Montevideo, Uruguay	—	—
Montreal, Canada	28	29
Naples, Italy	33	26
Newcastle, Australia	26	28
Newcastle-on-Tyne, England	30.5	44.5
New Haven, United States	23	22
New Orleans, United States	26	30
Newport, United States	18.7	16.7
Newport News, United States	28.7	32.7
New York, United States	34.6	—
Norfolk, United States	30.7	30.7
Odessa, Russia	30	26
Ostend, Belgium	31	33
Palermo, Italy	28	22
Pensacola, United States	32.6	29.4
Philadelphia, United States	28	32
Portland, Ore., United States	24	24
Portland, Me., United States	39.3	38.3
Port Lyttelton, New Zealand	26	26
Port Natal, South Africa	26	26
Port Royal, United States	25.3	28.3
Port Said, Africa	30	30
Port Tampa, Fla	24	—
Portsmouth, England	30	30
Portsmouth, United States	49	49
Providence, United States	29.4	31.4
Quebec, Canada	92	42
Rangoon, India	90	30
Riga, Russia	22	20
Rio de Janeiro, Brazil	34	—
Rostock, Germany	17	16
Rotterdam, Holland	27.8	33.8
Sabine Pass, United States	26.5	26.5
St. John, New Brunswick	36	48
St. Johns, Newfoundland	33.8	33.8
St. Petersburg, Russia	20.5	20.5
San Diego, United States	35.5	51.9
San Francisco, United States	39.2	39.2
Soo Canal, United States	21	—
Soo Canal, Canada	21	—
Savona, Italy	26	25
Savannah, United States	24	24
Shanghai, China	24	—
Southampton, England	41	43
Stettin (canal), Germany	23	26
Stockholm, Sweden	30	36
Suez Canal, Egypt	28	—
Sulina, Roumania	24	24
Sunderland, England	26.5	44.5
Sydney, Australia	34.5	35
Tampico, Mexico	27.4	25
Toulon, France	36	—
Trieste, Austria	30	30
Tunis, Tunis	30	21
Valparaiso, Chile	—	—
Venice, Italy	26	26
Vera Cruz, Mexico	31.5	31.5
Victoria, Canada	38	38
Washington, United States	22.5	25
Wilmington, N. C., United States	22.5	22.5
Yokohama, Japan	30	30
Average channel depth at mean high water at 123 ports		31.63
Average quay depth at mean high water at 106 ports		29.92
Depth at Constantinople taken		150.00
Depth at Dieppe		28.00
Average 31.63 with Constantinople		150.00
Average 30.66 without Constantinople		....

The Chicago, Milwaukee & Puget Sound Railway Co. has announced its intention to construct a large export lumber dock at Tacoma. The dock will be about 300 ft. long and 175 ft. wide and will be fitted with the best facilities for handling lumber. This arrangement will give the railway fully 1,000 ft. of dockage on the west side of the waterway and 500 ft. on the east side, all of which will be completed during the summer.

An order-in-council was recently issued amending subsection b, article 28, of the Canadian Rules of the Road for the Great Lakes, which provides that a danger signal shall be "several short and rapid blasts, not less than four of the whistle or siren of a steam vessel," to read "several short and rapid blasts of the whistle, not less than five."

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ATLANTIC COAST NOTES.

Office of the MARINE REVIEW,
Room 1005, No. 90 West St.,
New York City.

Little assurance is given by the wrecking companies that the steamer John H. Starin, ashore on Steeplechase island breakwater, at the entrance to the Bridgeport harbor, can be saved. The Starin left New Haven on Friday evening at 9 o'clock, but owing to encountering heavy weather and springing a leak was headed for Bridgeport harbor, where the master intended beaching the steamer on the shoals. Owing to the high wind prevailing and the difficulty in steering the vessel the ship became unmanageable and went on the rocks. She lies in 6 ft. of water at low tide and has a list of about 45 degrees. Her bottom is badly damaged, as is also the whole of her starboard side and port wheel.

It took the Cunard liner Mauretania just 4 days, 17 hours and 6 minutes to cover the long course between Daunt's Rock and Ambrose Channel lightship, off Sandy Hook, on her last run to this port, the best previous record being that of the Lusitania, 4 days, 19 hours and 36 minutes. The Mauretania's average speed for the voyage was 25.55 knots, and her best day's run 671 miles.

The French liner Savoie arrived at New York last week and reported having passed through a field of broken ice after passing the Banks. The liner was for over two hours among the ice, which was broken up into small cakes, the field extending over a length of 60 miles and as far north as the eye could see.

The dredging steamer George Brush, owned by the Beebe Brothers, oyster shippers, sank in New York harbor last week. She was partly loaded with oysters and is supposed to have been ran down by one of the heavy dredges.

The American-Hawaiian steamship Oregonian arrived at Spreckel's sugar refinery, Philadelphia, on Monday, with 7,000 tons of sugar from Puerto de Mexico. Her sister ship Isthmian sailed from the berth at the refinery just previous to the arrival of the Oregonian, having discharged 7,200 tons of Hawaiian sugar in three working days.

The sea-going tug Urbanus Dart caught fire off Romer Shoal beacon, New York lower bay, on Sunday, and was beached on Sandy Hook. She was ocean-bound, seeking a tow, when fire was discovered forward of the boilers. The flames spread so rapidly that it was considered advisable to head the vessel for the shore, where she has since turned turtle, the crew escaping not a moment too soon. The Dart was owned by Capt. John Gully, of Brooklyn, was not insured, and will probably be a total loss.

The Elvira Ball, an abandoned schooner which salvage steamers have been searching for without success, has again been sighted. This time she was passed by the Austrian steamship Georgia in latitude 38.44, longitude 68.45, on Feb. 18. The Georgia arrived at New York on Saturday from Trieste.

Chief Officer F. McKoige Jr., of the steamship Wilhelmina, makes the following interesting report on the submarine bell to the hydrographic office: "While entering Chesapeake bay on Feb. 5, 1909, atmosphere smoky and range of vision about three miles, I was in the cabin, which is aft and below the main deck, and the floor of which is level with the water line or a few inches below, when I heard the sound of the submarine fog bell on tail of the Horseshoe lightship. Going on deck I heard the fog whistle of the lightship. Descending to the foot of the companionway I heard the bell, apparently in my room near the floor, which is on the port side, and at the same time the sound of the whistle. At 5:50 p. m., we passed the lightship, ⅛ to ¼ mile, at an 8-knot speed, and heard the bell until 2 miles off. I also went into the captain's room on the starboard side and heard the faint sound of the bell, which sound apparently came into the cabin from the port side."

The Norwegian steamship Clotide Cuneo, which arrived at New York on Monday from Jamaica, reports that on Feb. 17, when two miles south of Cape Maysi, she sighted the Norwegian steamship Freke, from Baracoa, ashore at that point. The Freke asked to be reported and has also been spoken by the steamship Admiral Farragut.

About March 15 important changes will be made in the lights on the Delaware river. Range lights, to be known as Bellvue range lights, will be established to guide shipping in the channel from the Cherry island flats range line to the Schooner Ledge range lights. The lights inside of the mouth of the Christiana river and the Edgemoor light will be permanently discontinued.

Fire was discovered in the hold of the steamship Crostafels, of the Hansen line, lying at Pier 3, foot of Forty-eighth street, Bush docks, South Brooklyn, on the morning of Feb. 19. The fireboat Seth Low and the engines of the Brooklyn fire department flooded the vessel with water for over two hours before the fire was under control. The cargo consisted of burlap and jute, from Calcutta, Dec. 29. The Crostafels arrived at New York on the 18th from Philadelphia, where part of her cargo was discharged.

BRITISH ENCOURAGEMENT OF THE STUDY OF NAVAL ARCHITECTURE.

An offer has been received from Alexander Elder, of Southport, England, a former partner in the firm of Elder, Dempster & Co., Liverpool, to contribute $62,500 for the establishment of a chair of naval architecture in the University of Liverpool. This offer has been enthusiasticaly received as indicating that Britain is waking up to the great danger of falling behind other nations in the educational facilities for the study of naval construction. There are at present in the United Kingdom only two such schools of naval architecture, namely, at Glasgow and Durham University, and this offer is the outcome of the attention drawn to the need of more such facilities at the ship building centers by Sir William H. White, K. C. B., late constructor to the British admiralty. What is more this offer will no doubt influence some other wealthy ship owner to provide an experimental tank for research work, since there are only two such tanks in the United Kingdom, apart from the admiralty one at Gosport, and these two are privately owned by Denny Bros., of Dumbarton, and by John Brown & Co., Glasgow. This will entail a further expenditure of $75,000, and a great effort will now be made to make this a necessary equipment to the school of naval architecture. This provision would enable experiments to be made with a view to reduce the current waste of steam power which amounts to as much as 50 per cent, besides providing further facilities for research work in regard to the efficiency of propellers.

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Modern Methods of Lake Navigation for the Beginner.

BY CAPT. GEORGE TRIMBLE.

We now come to the point of finding the error of our compasses by the use of the Pelorus. We take a bearing of the sun, moon or stars, by our compass. We then look in the book of bearings to find what the bearing should be. The principle is the same as finding the error of our compass from a range. We find how our compass heads on the range and then find the correct bearing from the chart

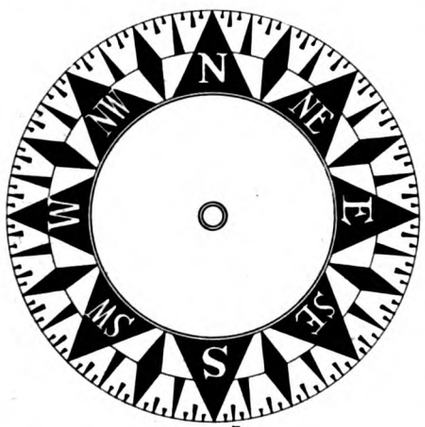

FIG. 7.

AN ORDINARY COMPASS CARD MARKED IN POINTS ONLY.

or lighthouse book. We find how the sun bears by our compass and then we find how it should bear from the book of Azimuths.

Bearings of the heavenly bodies are called Azimuths. The instruments for taking these bearings are all simply bearing finders but have different names and each have their special features. They are "The Pelorus," "The Polaris," "The Azimuth Attachment," "The Alidade," etc. With a knowledge of the working of either one you will easily handle them all. The Pelorus (or Polaris) being the one most generally used we will describe it first.

FIG. 8.

A COMPASS CARD MARKED IN POINTS AND DEGREES.

THE PELORUS.

Every ship has a Bearing Finder and most of the forward crew know how it is used. The Pelorus is a finely made bearing finder and can be used for all the purposes of an ordinary bearing finder. Its principal use however, is to find the error of a compass by bearings of the heavenly bodies. It has the same dumb compass card as is used on a bearing finder, the only difference being the degrees marked on the outside edge.

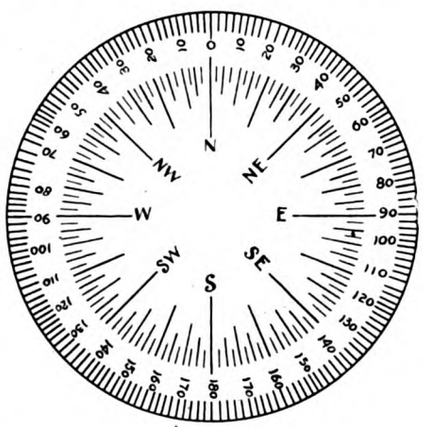

FIG. 9.

A PELORUS CARD.

On some makes of Pelorus this outside row of degrees is on a movable ring in order to allow for variation without figuring. Herewith we give a cut of an ordinary compass card, Fig. 7, a compass card marked in points and degrees, Fig. 8, and a pelorus card, Fig. 9.

Note the difference between a compass card marked in degrees and a Pelorus card. The compass card is marked 0 at north, 90 at east and back again to 0 at south. The Pelorus card is marked 0 at north, 90 at east and up to 180 at south. Any bearing on the east side of the Pelorus card between 0 and 180 is called east and any bearing on the west side of the card between 0 and 180 is called west. A bearing that showed on a compass as southeast would be called 135 east on a Pelorus.

Every circle has 360 degrees.

If you stood on the deck of a boat and faced the north and then turned slowly toward the east and around to south your eye would have travelled over 180 degrees of the horizon. This would be the east half of the horizon. If you now faced the north again and turned to the west and around to south your eye would have travelled over the west part of the circle of the horizon or another 180 degrees.

Now, from where you stand, imagine that you can see the horizon marked off in degrees beginning 0 at north and so on, around to 90 at east and to 180 at south.

Thus our cut shows every 10 degrees, Fig. 10.

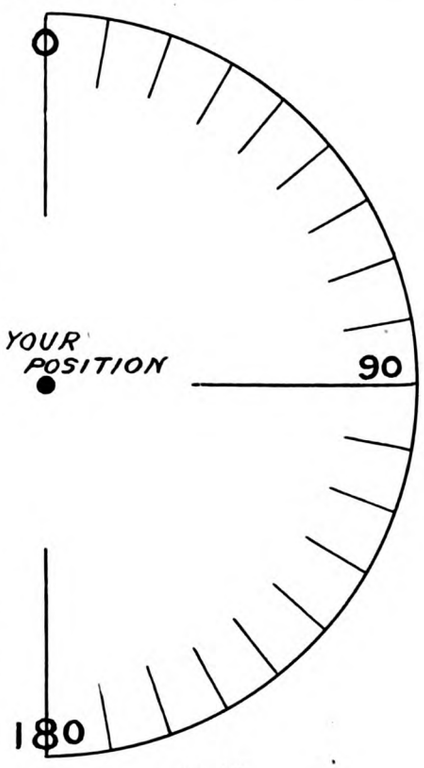

FIG. 10.

The Pelorus is marked to represent this circle of the horizon. If (from your position) you see the sun directly over the figure 90 her bearing is 90 east. Or properly speaking "her Azimuth is 90 east."

Your Pelorus is simply a dumb card marked to represent a compass but with the circle of degrees on the outside. You set this pelorus card to

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head the same as your compass heads. You point the sight bar of the pelorus at the sun. This then gives you the bearing of the sun by your compass. If your compass is not correct you will not get the correct bearing. The book of azimuths will give you the correct bearing or azimuth. From this you can then easily figure the error of your compass in just the same manner that you find the error from a range.

So you see a Pelorus is a very simple affair. An Azimuth attachment is simply a pelorus without a card. It has a sight vane and pointer and attaches directly to the compass. But it is not as convenient because as it is attached to the compass you sometimes cannot get a clear view of distant objects. The Pelorus can be set any place and if it is set to read the same as a compass it answers the same purpose.

Therefore you can see that a Pelorus is really a bearing finder. And an Azimuth is a bearing of a heavenly body measured in degrees from north. A book of Azimuths is a book of bearings. The same book can be used for the sun, moon, planets or stars.

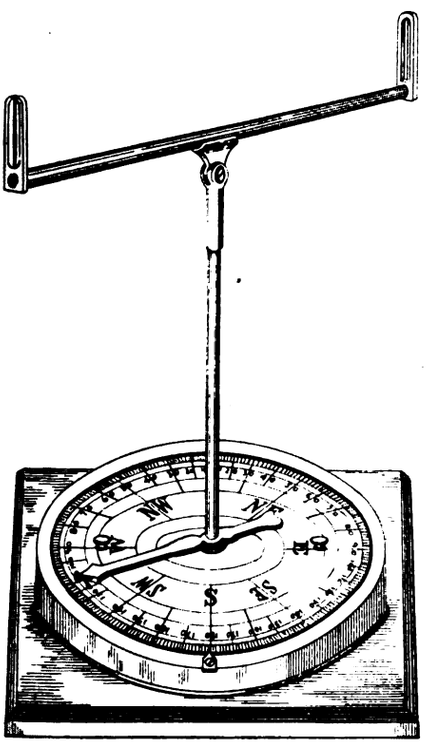

FIG. 11.

ONE STYLE OF PELORUS.

The outfit required for taking bearings of the heavenly bodies is as follows:

A pelorus.

An Azimuth book.

A Nautical Almanac.

A Pelorus Slate (a common school slate made into a form as shown under the head of "Pelorus Slate").

A Pelorus card (make this yourself, see "Pelorus card").

A watch or clock set to Central or Eastern Standard time. If you are doing practice work ashore you will also need a compass. One can often be borrowed or rented.

THE PELORUS.

Some large lake vessel owning companies supply the whole outfit to their masters. The best makes of Pelorus cost from $40 to $50. A cheap instrument, designed especially as a practice instrument in connection with this work, can be bought from Frank Morrison, manufacturer of nautical instruments, Cleveland, O. The price is $10. This is a neat instrument and will do good work.

But you can make a practice instrument yourself, without the cost of one cent. See "How to make a practice Pelorus." Under the head of "The different kinds of Pelorus" you will find a description of the different makes of Pelorus, their special features, and their cost. When you can operate one kind of Pelorus you can operate any kind. The special features of each make will be explained to you when you purchase an instrument. The Shadow Dial Pelorus being so generally used on the lakes we will give a short sketch of it here.

THE SHADOW DIAL PELORUS.

The Shadow Dial Pelorus is made on the same principle but the dial is marked in reverse, as follows:

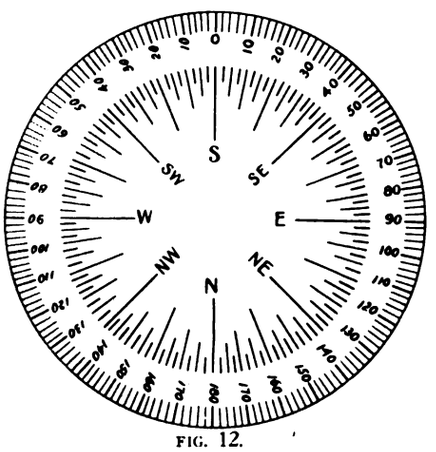

FIG. 12.

You will see that the card on this Pelorus is marked differently than a compass card. South is at 0 or where north is on the ordinary Pelorus. You will also see that the other readings on the card are reversed. Instead of putting the compass course to the ship's head as with the ordinary Pelorus you get the correct bearing from the book first and put this at the ship's head. A thin wire, standing in the center of the Pelorus will then throw a shadow on the correct course the ship is steering. If the heavenly body used won't throw a shadow then the ordinary sight bar is used and the pointer will show the correct course. This shows the error in a very simple way. If your compass does not show the same course as is shown on the Pelorus you can name the error at a glance.

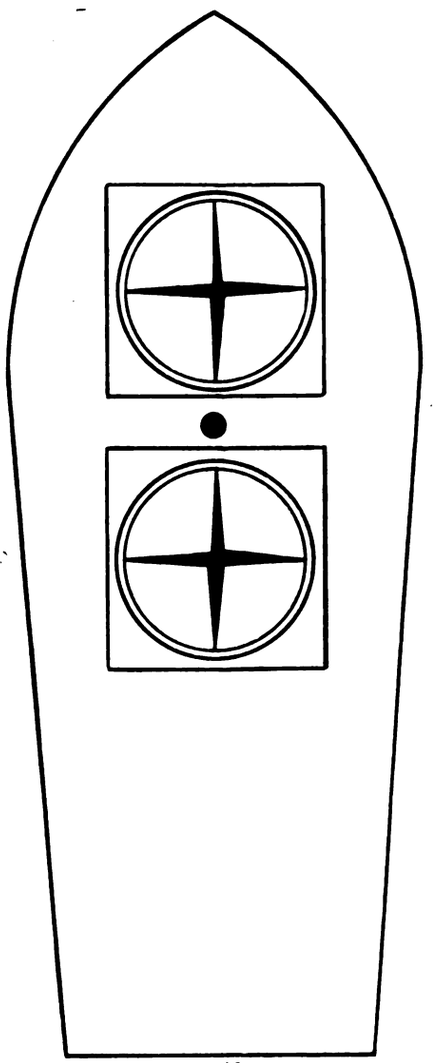

FIG. 13.

YOUR COMPASS.

YOUR PELORUS.

By naming the error we mean that we find out whether it is "East deviation" or "West deviation."

AN AZIMUTH BOOK.

There are several different Azimuth books published, those generally used on the Great lakes being The Red Book of Azimuth Tables, price 50 cents, Burwood's Azimuth tables, price $2, and Henrich's Book of Azi-

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muths, price $3.50. Any of these books can be bought from the Penton Publishing Company, Cleveland, Ohio.

But I think a student will be well repaid for the extra expense by buying the Henrich Azimuth Book. The process of finding the correct bearing in this book is simplified very much and there is less chance of mistake.

In home practice you will also need something to represent a boat. Nothing very elaborate is required. We need not look for exactness. When you understand the workings of the Pelorus you will have gained your point; later on you may have a chance to try your skill aboard a boat where everything is exact. A piece of rough board, pointed at one end, will do to represent a boat. Make it so it will swing on a pin in the middle. You can then turn it around to head in any direction. Your compass and Pelorus can then be set on this "Ship" the lubber line of each in line with the pointed end.

Say, for example, that your boat's compass shows north. Then set your compass to show north also. Point your sight bar at the sun and the lower pointer will show you the bearing (or Azimuth). This gives you the bearing of the sun as shown by your compass. If your compass is not correct then the bearing will not be correct. You will find the correct bearing in the Azimuth Book.

It is not so easy to find the correct bearing in the book as you might think. But it is quickly done when you have once mastered the subject.

HOW TO FIND THE AZIMUTH IN THE BOOK.

In order to enter the Azimuth book at the right page and find the required Azimuth you must know the following three things:

(1) The latitude of your ship (the position of your ship on the earth's surface).

(2) The latitude of the Sun or other heavenly body (called Declination).

(3) The correct time. Sun time for bearings of the Sun, Sidereal time for the moon, planets and stars. You figure either kind from a watch or clock set to Standard time.

Below we show a reproduction of a part of a page of Henrich's Book of Azimuths.

On the upper left hand corner you read "11 hrs 56 m to 11 hrs 24 m."

This means that bearings can be found below for any time between 11:56 A. M. and 11:24 A. M.

On the upper right hand corner you read "0 hrs 4 m to 0 hrs 36 m."

This means that bearings can be found below for any time between 12:04 and 12:36 P. M. (or noon.)

Across the top you read "Declination—Opposite to—Latitude."

This means that if the Declination of the Sun is south the latitude of the ship must be north or if the Declination of the sun is north the latitude of the ship is south. In another part of the book you will see where this line reads "Declination—Same as—Latitude." This means that if the Declination of the Sun is north then the latitude of the ship is also north. The column at the left shows the time A.M. 11-56, 11-52, etc. The column at the right shows the time P. M. 0-04, 0-08, etc. Bearings in this book are shown every four minutes.

The second column at the left shows latitude. The Great Lakes are all between latitude 49 and 41 north.

The row of figures across the top show Declination—

0°	1°	2°	3°	4°	5°	6°	etc.

Now we will find a bearing (or azimuth).

We will say, for example, that the Sun time is 11-56, our ship is in north latitude 42, and the sun is in South Declination 4. You should now be able to find the Azimuth you require —178.7 (178 7/10). You had better call this 179, as it is nearer 179 than 178. Don't try to work fractions in your problem—take the nearest full degree. Therefore our bearing is 179 east. It must be east if taken any time before noon; it would be west if taken any time after noon.

Of course in working the above problem it is necessary that you know just how to find the Sun time, the latitude of the ship and the Declination of the sun. For those that do know these things the problem is very simple. But for those who can not figure sun time, and find latitude and Declination we advise that they master the whole subject before going farther. On our Pelorus cards (shown under the head of "Pelorus cards") you will find all the data needed to take bearings of the sun and to find the azimuth in the book. But you should understand the whole subject thoroughly before going farther.

11 hrs. 56 m. to 11 hrs. 24 m. — 0 hrs. 4 m. to 0 hrs. 36 m.

AZIMUT OR TRUE BEARING.

Time A. M.	Latitude	DECLINATION—OPPOSITE TO—LATITUDE.														Latitude	Time P. M.
H. M.	°	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	°	H. M.
	49	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.8	178.9	178.9	178.9	178.9	178.9	49	
	48	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.8	178.9	178.9	178.9	178.9	48	
	47	178.6	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.8	178.9	178.9	178.9	47	
11-56	46	178.6	178.6	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.8	178.9	178.9	46	0-04
	45	178.6	178.6	178.6	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.9	178.9	45	
	44	178.6	178.6	178.6	178.6	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.9	44	
	43	178.5	178.6	178.6	178.6	178.6	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	178.8	43	
	42	178.5	178.5	178.6	178.6	178.6	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	178.8	42	
	41	178.5	178.5	178.5	178.6	178.6	178.6	178.7	178.7	178.7	178.7	178.7	178.8	178.8	178.8	178.8	41	
	49	177.4	177.4	177.4	177.5	177.5	177.5	177.6	177.6	177.6	177.7	177.7	177.7	177.8	177.8	177.8	49	
	48	177.3	177.3	177.4	177.4	177.5	177.5	177.5	177.6	177.6	177.6	177.7	177.7	177.7	177.8	177.8	48	
	47	177.3	177.3	177.4	177.4	177.4	177.5	177.5	177.5	177.6	177.6	177.6	177.7	177.7	177.7	177.8	47	
11-52	46	177.2	177.3	177.3	177.4	177.4	177.4	177.5	177.5	177.5	177.6	177.6	177.7	177.7	177.7	177.7	46	0-08
	45	177.2	177.2	177.3	177.3	177.4	177.4	177.4	177.5	177.5	177.6	177.6	177.6	177.7	177.7	177.7	45	
	44	177.1	177.2	177.2	177.3	177.3	177.4	177.4	177.4	177.5	177.5	177.6	177.6	177.6	177.7	177.7	44	
	43	177.1	177.1	177.2	177.2	177.3	177.3	177.4	177.4	177.5	177.5	177.5	177.6	177.6	177.6	177.7	43	
	42	177.0	177.1	177.1	177.2	177.2	177.3	177.3	177.4	177.4	177.5	177.5	177.5	177.6	177.6	177.7	42	
	41	177.0	177.0	177.1	177.1	177.2	177.2	177.3	177.3	177.4	177.4	177.5	177.5	177.5	177.6	177.6	41	

FROM HENRICH'S BOOK OF AZIMUTHS.

RYAN-TANNING BOAT HANDLING GEAR.

The American Association of Masters, Mates and Pilots adopted the following resolution at their annual meeting:

"'The Ryan-Tanning Boat Handling Gear' was fully demonstrated before the national officers and representatives of the American Association of Masters, Mates and Pilots, in convention assembled at Washington, D. C., Jan. 18 to 23, 1909.

"We desire to go on record as having unanimously endorsed this device as an equipment that we believe all steam vessels should carry, for the reason that we feel sure it would be a great improvement to the equipment of all vessels, for the safety of both life and property at sea and on the inland waters of the United States."

A new 20-ton refrigerating plant installed in the training station at Newport, R. I., by the Kroeschell Bros. Ice Machine Co., of Chicago, has just been given a satisfactory trial run. The plant is required to cool 300 gallons of drinking water an hour to 40 degrees, keep the refrigerating room for meats in barracks B down to 22 to 28 degrees and freeze 2½ tons of ice a day. The plant is of the carbonic anhydride system which, it is contended, is more economical than ammonia.

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THE MANCHESTER SHIP CANAL.

The Manchester Ship Canal has continued its progress since 1894 in such a triumphant manner, that the setback revealed by the report for the half year ended Dec. 31, last, will be a great disappointment, alike to shareholders and the general public.

The report states that the receipts or capital amounted to £78,273 in respect of the issue of £350,000 4 per cent debenture stock. The expenditure out of capital was £31,565, but as the proceeds of sales of land and plant amounted to £641 the net outlay was £30,924. The total expenditure on capital amounted to £16,729,-154, leaving a balance to credit of £293,066. The ship canal revenue receipts amounted to £270,145, and the expenditure to £131,039, leaving a credit balance of £139,106. The profit of the Bridgewater department was £10,469. The balance carried to net revenue account was, therefore, £149,-575, to which was added for bankers' and general interest, making an available balance of £151,607, which was distributed as follows: Interest on the first and second mortgage debentures, £44,743; interest on 3½ and 4 per cent debenture stocks, £9,672; interest on the mortgage of surplus lands, £1,000; rent on transit shed, dock No. 8, £3,130; rent on dock No. 9 and transit sheds, £12,500; and the remainder £80,562 to the corporation of Manchester on account of interest on the debentures they hold. The total amount paid to the corporation in respect of the year 1908 was £128,-041, and the balance required to make up the £160,000 (the annual amount of interest payable in respect of the £5,000,000 loan from the corporation of Manchester) will be satisfied by the issue to the corporation of £31,-959 of Manchester Ship Canal (Corporation) 3½ per cent preference stock in accordance with the provisions of the Manchester ship canal (finance) act, 1904.

SHIP CANAL DEPARTMENT.

The weight of toll-paying merchandise which passed over the Ship Canal during the two half-yearly periods was:

	6 months ended Dec. 31, 1907. tons.	6 months ended Dec. 31, 1908. tons.
Sea-borne traffic	2,656,201	2,174,888
Barge traffic	150,766	138,435
Total	2,806,967	2,313,323

The financial result of the half-year in the ship canal department was a decrease of £17,106 in the receipts, of £10,067 in the expenditure, and of £7,039 in the profit as compared with the corresponding period of the previous year. The weight of the sea-borne merchandise traffic showed a decrease of 481,313 tons, but 426,908 tons of the falling off was caused by reduced exports of coal, which during the second half of the previous year were very largely augmented by the diversion of Yorkshire coal to Partington. The receipts for the year 1908 were £506,975, against £535,585, a decrease of £28,610. The expenditure was £10,973 less. The net result was a decrease of £17,637 in the profit of the Ship Canal Department as compared with the year 1907.

The following is a statement of the toll-paying merchandise traffic and the receipts of the port for each of the fifteen years during which the Ship Canal has been open.

Year.	Sea-borne traffic, tons.	Barge traffic, tons.	Total tons.	Receipts.
1894....	686,158	239,501	925,659	£ 97,901
1895....	1,087,443	271,432	1,358,875	137,474
1896....	1,509,658	316,579	1,826,237	182,330
1897....	1,700,479	365,336	2,065,815	204,664
1898....	2,218,005	377,580	2,595,585	236,225
1899....	2,429,168	348,940	2,778,108	264,775
1900....	2,784,843	275,673	3,060,516	290,830
1901....	2,684,833	257,560	2,942,393	309,517
1902....	3,137,348	280,711	3,418,059	358,491
1903....	3,554,636	292,259	3,846,895	397,026
1904....	3,618,004	299,574	3,917,578	418,043
1905....	3,993,110	260,244	4,253,354	449,436
1906....	4,441,241	259,683	4,700,924	498,837
1907....	4,927,784	282,975	5,210,759	535,585
1908....	4,317,965	264,531	4,582,496	506,975

GOOD TEST OF SUBMARINE BELL.

An interesting experiment in regard to the efficacy of the submarine bell system of signalling was carried out off New York this week, when a man blindfolded piloted the tug Eugene F. Moran from a point three miles out in the open sea to the Ambrose channel, picking up the light vessel by the sound of the submarine signal bell and following the course by the guiding sound of the bell ringing some 30 ft. below the surface.

Among those who were on board to witness the test were: Robert Haskell and R. J. Wilkes of the lighthouse department; James C. Horton, general passenger and traffic manager of the Savannah Line; E. C. Wood and H. J. Fay, engineers of the Submarine Signal Co.; J. J. Lynn, the company's superintendent for the great lakes; Daniel E. Lynn, head of the National Lead Co.; Capt. F. S. Reilley, U. S. A.; Custom Special Lovell H. Jerome, Col. Robert Townsend, former assistant district attorney, and Eugene F. Moran.

DREDGE OWNERS AND LABOR.

The Dredge Owners Protective Association has reached an agreement with labor for the season of 1909. The schedule is in all essentials the same as last year except that dredge engineers, cranesmen and dredge workers are allowed $2.50 a month extra for board. The wages of dredge engineers vary from $110 to $150 a month; cranesmen, $99 a month; tug captains, $120 to $165; tug engineers, from $110 to $120; international dredge workers, from $55 to $66; tug firemen and linesmen, $55 to $65; drill boat workers, $2.40 to $3.30 a day. As the Great Lakes Towing Co. has a three years' contract with its men, expiring next year, this concludes the agreement with labor aboard tugs for the season of 1909.

AMBROSE CHANNEL TO BE LIGHTED.

On January 27 an appropriation bill was laid before congress providing for the buoying and lighting of the Ambrose Channel, New York harbor. On the passing of this measure and the immediate application of the funds to the purpose to which they are assigned, the Ambrose Channel will be navigable at all hours of the day and night.

The officers of the United States corps of engineers having this improvement in charge report a width of 800 ft. out of the 1,000 ft. eventually to be made, as having a depth of 40 ft. Buoys and bells will be placed about a mile apart on either side.

For the greater safety of trans-Atlantic shipping there will be certain restrictions of the use of the channel, tugs, small craft and sailing vessels being required to use other channels.

WOODEN SHIP BUILDING.

B. B. Crowninshield, naval architect, engineer and yacht builder of national fame, is visiting Seattle and San Francisco on a tour of pleasure. Speaking of the ship building situation on the Pacific coast, Mr. Crowninshield said while in Seattle, "To my mind the building of wooden ships on Puget Sound is inevitably bound to become a great industry, which will be in its height when wooden ships are no longer built in the east. The fir which grows in this country is an ideal material for the construction of wooden vessels, as it can be used admirably for keel timbers in place of oak, as well as for planking. Wooden vessels will always be in demand, so long as conditions admit of their economical construction. I am sure that the next 25 years will see a tremendous tonnage of wooden vessels built on Puget Sound."

James McGregor, vice president of the Detroit & Cleveland Navigation Co., died at his home in Detroit last week, at the age of 79 years.

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ANOTHER NAVAL COMMISSION.

President Roosevelt has just appointed a new commission "to consider certain needs of the navy," the members of which are identical with the previous commission which conferred in Washington two weeks ago on naval affairs.

The new body, which convenes Feb. 5, is headed by Paul Morton, formerly secretary of the navy, the other members being Justice Moody, also ex-secretary of the navy; Judge A. G. Dayton, formerly chairman of the house committee on naval affairs, and Rear-Admirals S. B. Luce, A. T. Mahan, William M. Folger, Robley D. Evans and William S. Cowles, all of whom are on the retired list.

At the former conference the commission adopted three resolutions. The first was that in their opinion Secretary Newberry should put in operation a temporary plan for a change in the administration of the navy department. They also approved the plan for reorganization which had been formulated by the secretary of the navy.

In another resolution the members of the commission suggested that a reorganization commission should be appointed by the president, with the approval and if possible at the instance of congress. Nothing was done for some time until Senator Hale submitted a resolution, which was agreed to, authorizing the senate committee on naval affairs to inquire into the method of naval expenditures, and to determine "whether legislation by congress is needed and is desirable to improve the administration of the navy department."

PRESIDENT'S ACTION A SURPRISE.

This result was highly unsatisfactory to the naval critics, who have been exerting all their influence for the appointment of a commission. They feared that the senate committee investigation would not be a thorough one but merely a defense of the present bureau system. It was then that the president was prevailed upon to issue his order creating the desired board. This action came as an entire surprise, not only to the navy department as a whole, with the exception of the "naval critics," but to Secretary Newberry as well. The appointment of the commission is a distinct score for the "critics" in their controversy with the bureaus.

OPPOSITION MAY DEVELOP.

It is not unlikely that the appointment of this commission will occasion some criticism. It will probably be pointed out that the members of the commission less than two weeks ago over their signatures suggested that any such body have the approval of congress before being brought into existence. It is not unlikely that the statute prohibiting the government from accepting the unpaid services of any individual will be cited, though this objection may be overcome by paying the members of the commission out of the funds of the navy department.

The bureau chiefs under the present organization recognize that the personnel of the commission and the president's letter of instructions under which the commission will work, are distinctly favorable to the naval critics, and will fight accordingly. The president's letter to the commission is as follows:

I have appointed you as a member of a commission to consider certain needs of the navy. The organization of the department is not such as to bring the best results, and there is a failure to co-ordinate the work of the bureaus and to make the department serve the one end for which it was created, that is, the development and handling of a first class fighting fleet. With this proposition in view I will ask you to consider:

(1). All defects in the law under which the navy department is now organized, including especially the defects by which the authority of chiefs in bureaus is made, in certain respects, practically equal to that of the secretary or the president.

(2). The division of responsibility and consequent lack of co-ordination in the preparations for war and conduct of war.

(3). The functions of certain bureaus, so as to see whether it is not possible to consolidate them.

(4.) The necessity of providing the secretary of the navy with military advisers, who are responsible to him for co-ordinating the work of the bureaus and for preparation for war.

(5.) The necessity for economical allotment and disbursement of appropriations and for a system which will insure strict accountability.

(6.) Finally, I want your views as to how best to recognize and emphasize the strictly military character of the navy, so that preparation for war shall be controlled, under the secretary, by the military branch of the navy, which bears the responsibility for the successful conduct of war operations.

I wish to have the above subjects considered under two general heads:

(1.) As to the fundamental principles of an organization that will insure an efficient preparation for war in time of peace, a separate report under this head to be submitted at the earliest practicable date.

(2.) Specific recommendations as to the changes in the present organization that will accomplish this result, the report under this head to be submitted later.

In addition to the above reports, I desire your recommendation as to the number, location, and general facilities of the navy yards which are required by strategic considerations in time of war and for maintaining the fleet in constant readiness for war in time of peace.

The whole situation in the navy department, as between the two factions, has been rendered more acute by the president's action, coming as it does unannounced on the heels of Mr. Newberry's reorganization. Mr. Taft's secretary of the navy will find the pot "boiling" when he comes into office, and the first few months under the new administration of the navy department are bound to be lively and full of incident. Before the controversy is settled, it seems probable that the country will learn a lot about the navy and how its affairs are administered.

The Akers emergency steam steerer is now installed upon 14 lake ships in commission and is being installed on four steamers now building.

BIDS FOR WOODEN PILING.

Bids received by Lieut.-Col. Graham D. Fitch, corps of engineers, United States Army, opened Feb. 15, 1909, for furnishing and delivering 134,620 linear ft. of piling floating in water at Superior entry, Duluth-Superior Harbor, were as follows:

Duluth Log Co., Duluth, Minn....	$22,077.68
*A. J. MacDonald, Superior, Wis..	23,757.90
Zenith Cedar Co., Duluth, Minn....	22,212.30
Martin Bros., Duluth, Minn.....	22,548.85
Lake Superior Piling Co., Duluth, Minn.	24,231.60
H. Younker, Ashland, Wis.....	18,173.70
Virginia & Rainy Lake Co., Duluth, Minn.	25,577.80

*Bid irregular.

BIDS FOR REPAIRING PIER.

Bids received by Col. M. B. Adams, corps of engineers, United States army, opened Feb. 16, for repairing south pier at Frankfort, Mich., were as follows:

Burk, Smith & Nelson, Muskegon, Mich.	$4,458.74
Robert Love, Muskegon, Mich.....	4,804.80
Bennett-Schnorbach Co., Muskegon, Mich.	5,516.88

BIDS FOR NEW PIER AT MILWAUKEE.

Bids received by Major W. V. Judson, corps of engineers, United States army, for building reinforced concrete caissons and pile pier, removing old pier and dredging at Milwaukee harbor, opened Feb. 12, 1909, were as follows:

Standard Construction Co., Chicago, Ill.	$118,556.50
Samuel O. Dixon, Milwaukee, Wis.	124,299.00
William H. Gillen, Milwaukee, Wis.	105,065.50
Greiling Bros. Co., Green Bay, Wis.	121,980.00

It is probable that the contract will be awarded to William H. Gillen.

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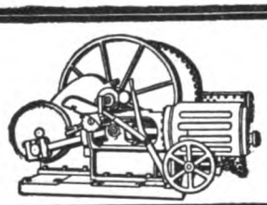
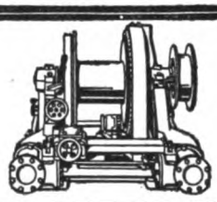
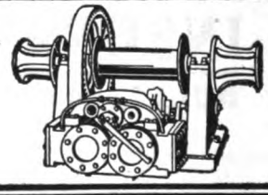

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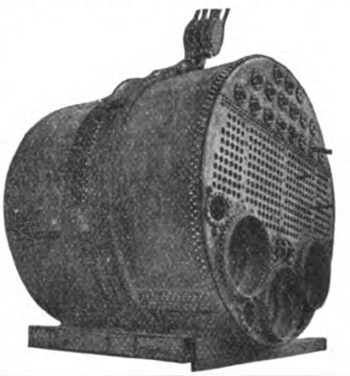

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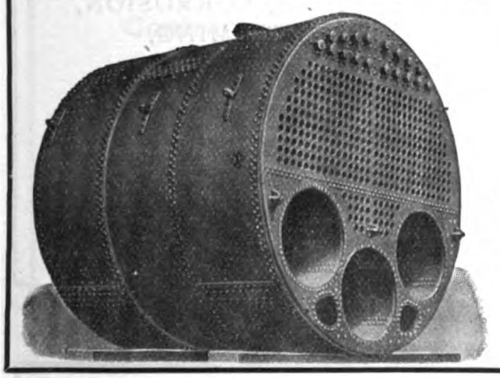

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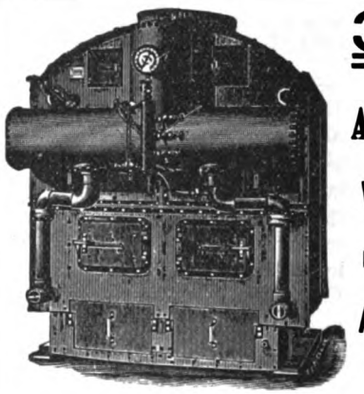

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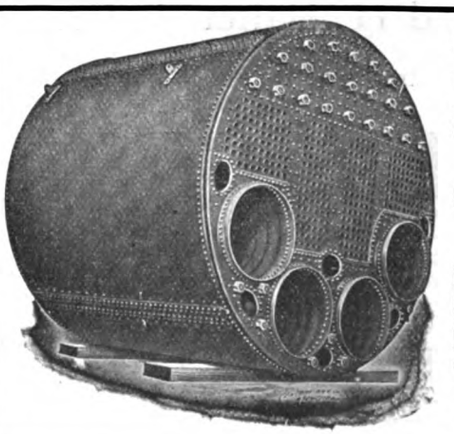

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